GALES FERRY INTERMODAL

PRESENTATION TO LEDYARD PLANNING & ZONING COMMISSION DEC 19, 2024

Questions posed by Ledyard Planning & Zoning Commission Members

Commission Question:

Did the sound study include the clearing the trees, removal of stumps, chipping of the lumber?

GFI Response:

Land clearing is a discreet and limited duration event which occurs at the commencement of each phase of the excavation. It is anticipated that land clearing activities for each of Phases 1 through 4 will require 10 to 12 working days, with 4 to 5 working days required for clearing in Phase 5. With respect to land clearing, we do not normally include land clearing as a part of the noise study for site development. As stated above, this is a temporary activity. The clearing will involve excavator mounted hydraulic shears and limbing. This is not expected to have higher sound levels than the excavators that are planned for the excavation phase of the project, and which are included in the model. The applicant does not expect chainsaws to be used on site. In addition, there may be chipping of whole trees. A portable diesel chipper has a sound power of approximately 122 dBA, which is the same as the rock crushers modeled in the noise study.

Response provided by Ken Kaliski of RSG, Inc.

Commission Question:

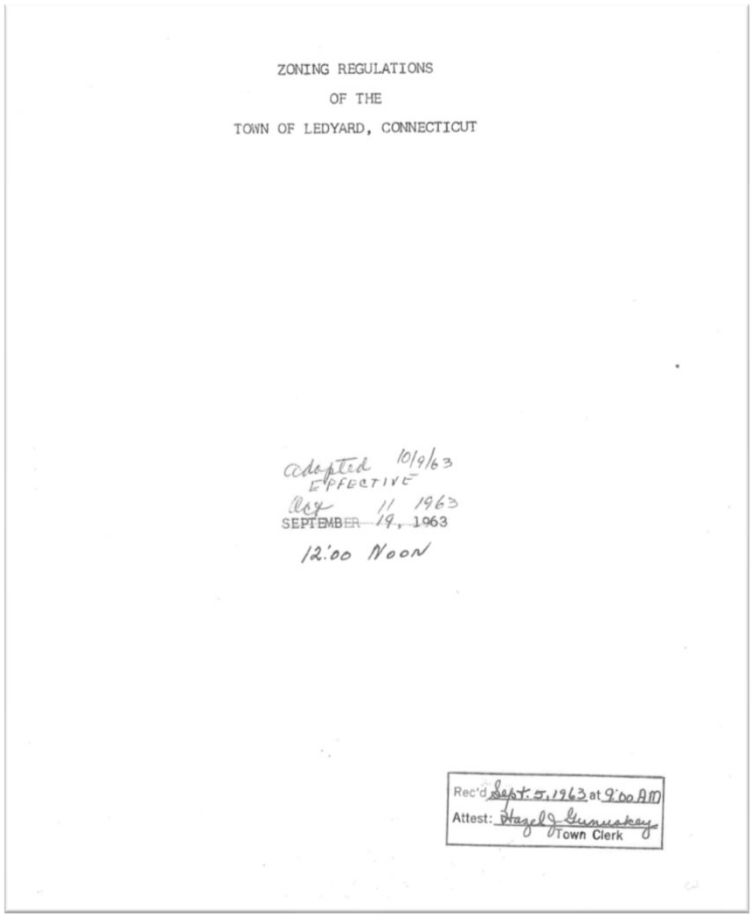
Who marked up the 1963 and 1975 Regulations as submitted by Eric Treaster at the end of his narrative from 12/5? Do we have a later set of regulations from around that time that shows the omission?

GFI Response:

The Applicant assumes that this question refers to the attachment to Exhibit 204 in the Administrative Record which was submitted by Eric Treaster. The Applicant has no knowledge as to who has provided the notational comments. However, the Applicant is confident that they were added in conjunction with the current administrative proceeding and do not appear in the original record. The Applicant is attaching hereto, as **Exhibit A**, a copy of the 1963 original Zoning Regulations obtained from the Ledyard Town Clerk as well as, as **Exhibit B**, a copy of the applicable provisions of the Zoning Regulations subsequent to the 1975 amendment.

Response provided by Harry B. Heller

GFI Response:



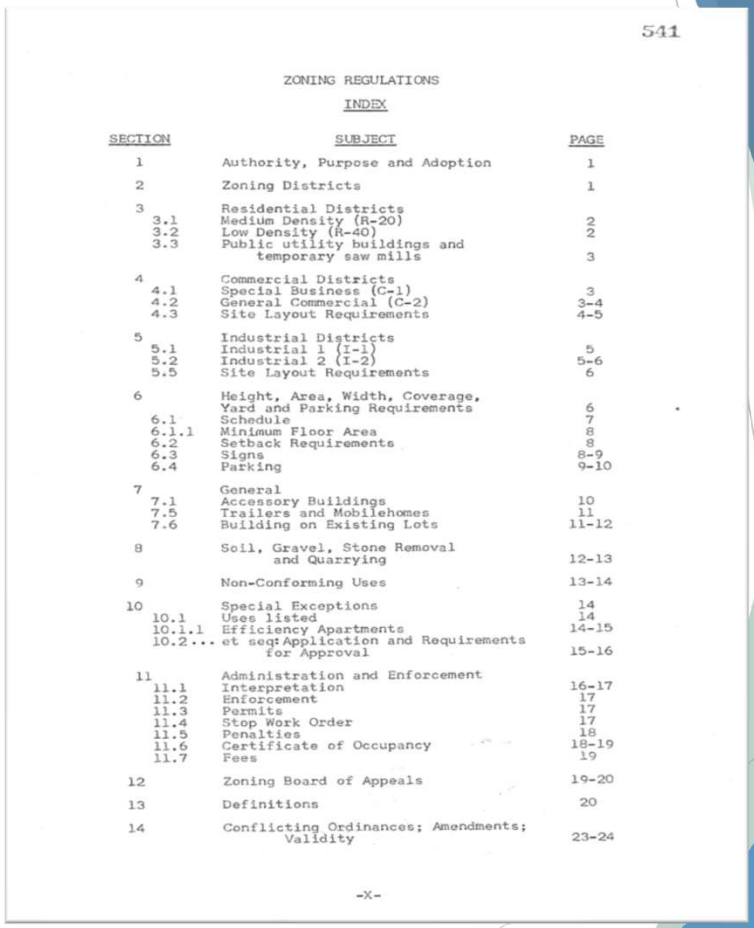
ZONING REGULATIONS

OF THE

TOWN OF LEDYARD, CONNECTICUT

adopted 10/9/63
EFFECTIVE
Nov 11 1963
SEPTEMBER 19, 1963
12:00 Noon

Rec'd Sept. 5, 1963 at 9:00 AM
Attest: Hazel J. Gunnarsson
Town Clerk



ZONING REGULATIONS

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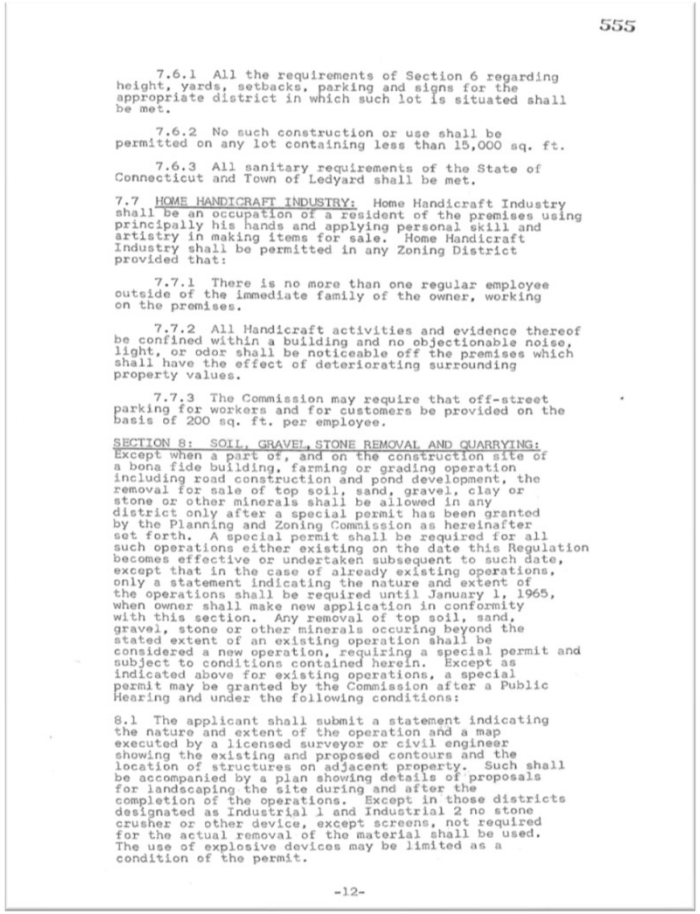
Exhibit A

1963 ZONING REGULATIONS

GFI Response:



555

7.6.1 All the requirements of Section 6 regarding height, yards, setbacks, parking and signs for the appropriate district in which such lot is situated shall be met.

7.6.2 No such construction or use shall be permitted on any lot containing less than 15,000 sq. ft.

7.6.3 All sanitary requirements of the State of Connecticut and Town of Ledyard shall be met.

7.7 HOME HANDICRAFT INDUSTRY: Home Handicraft Industry shall be an occupation of a resident of the premises using principally his hands and applying personal skill and artistry in making items for sale. Home Handicraft Industry shall be permitted in any Zoning District provided that:

7.7.1 There is no more than one regular employee outside of the immediate family of the owner, working on the premises.

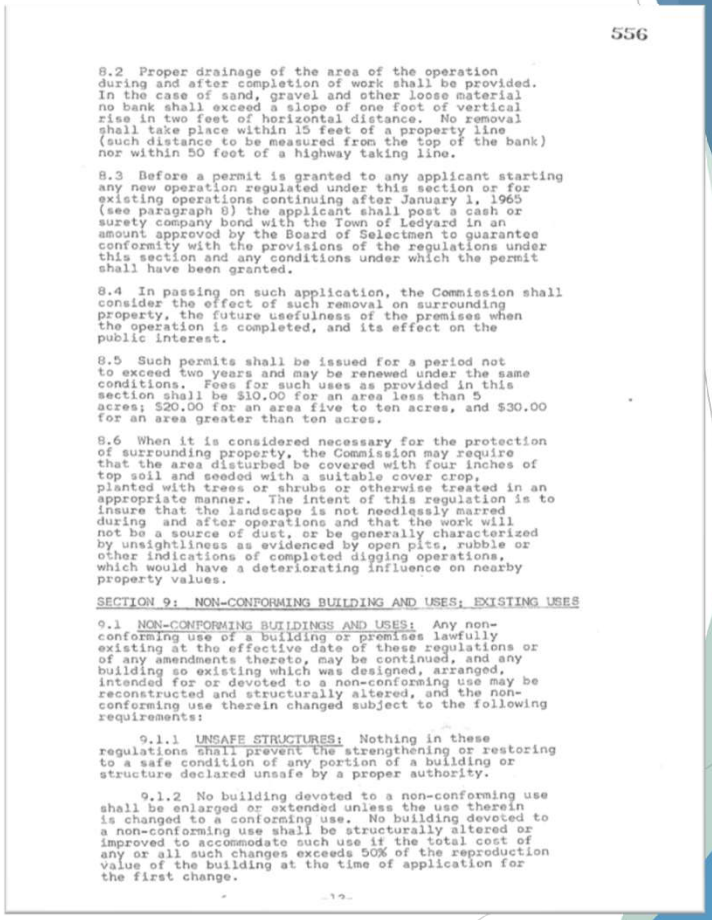
7.7.2 All Handicraft activities and evidence thereof be confined within a building and no objectionable noise, light, or odor shall be noticeable off the premises which shall have the effect of deteriorating surrounding property values.

7.7.3 The Commission may require that off-street parking for workers and for customers be provided on the basis of 200 sq. ft. per employee.

SECTION 8: SOIL, GRAVEL, STONE REMOVAL AND QUARRYING: Except when a part of, and on the construction site of a bona fide building, farming or grading operation including road construction and pond development, the removal for sale of top soil, sand, gravel, clay or stone or other minerals shall be allowed in any district only after a special permit has been granted by the Planning and Zoning Commission as hereinafter set forth. A special permit shall be required for all such operations either existing on the date this Regulation becomes effective or undertaken subsequent to such date, except that in the case of already existing operations, only a statement indicating the nature and extent of the operations shall be required until January 1, 1965, when owner shall make new application in conformity with this section. Any removal of top soil, sand, gravel, stone or other minerals occuring beyond the stated extent of an existing operation shall be considered a new operation, requiring a special permit and subject to conditions contained herein. Except as indicated above for existing operations, a special permit may be granted by the Commission after a Public Hearing and under the following conditions:

8.1 The applicant shall submit a statement indicating the nature and extent of the operation and a map executed by a licensed surveyor or civil engineer showing the existing and proposed contours and the location of structures on adjacent property. Such shall be accompanied by a plan showing details of proposals for landscaping the site during and after the completion of the operations. Except in those districts designated as Industrial 1 and Industrial 2 no stone crusher or other device, except screens, not required for the actual removal of the material shall be used. The use of explosive devices may be limited as a condition of the permit.

-12-



556

8.2 Proper drainage of the area of the operation during and after completion of work shall be provided. In the case of sand, gravel and other loose material no bank shall exceed a slope of one foot of vertical rise in two feet of horizontal distance. No removal shall take place within 15 feet of a property line (such distance to be measured from the top of the bank) nor within 50 feet of a highway taking line.

8.3 Before a permit is granted to any applicant starting any new operation regulated under this section or for existing operations continuing after January 1, 1965 (see paragraph 8) the applicant shall post a cash or surety company bond with the Town of Ledyard in an amount approved by the Board of Selectmen to guarantee conformity with the provisions of the regulations under this section and any conditions under which the permit shall have been granted.

8.4 In passing on such application, the Commission shall consider the effect of such removal on surrounding property, the future usefulness of the premises when the operation is completed, and its effect on the public interest.

8.5 Such permits shall be issued for a period not to exceed two years and may be renewed under the same conditions. Fees for such uses as provided in this section shall be $10.00 for an area less than 5 acres; $20.00 for an area five to ten acres, and $30.00 for an area greater than ten acres.

8.6 When it is considered necessary for the protection of surrounding property, the Commission may require that the area disturbed be covered with four inches of top soil and seeded with a suitable cover crop, planted with trees or shrubs or otherwise treated in an appropriate manner. The intent of this regulation is to insure that the landscape is not needlessly marred during and after operations and that the work will not be a source of dust, or be generally characterized by unsightliness as evidenced by open pits, rubble or other indications of completed digging operations, which would have a deteriorating influence on nearby property values.

SECTION 9: NON-CONFORMING BUILDING AND USES; EXISTING USES

9.1 NON-CONFORMING BUILDINGS AND USES: Any non-conforming use of a building or premises lawfully existing at the effective date of these regulations or of any amendments thereto, may be continued, and any building so existing which was designed, arranged, intended for or devoted to a non-conforming use may be reconstructed and structurally altered, and the non-conforming use therein changed subject to the following requirements:

9.1.1 UNSAFE STRUCTURES: Nothing in these regulations shall prevent the strengthening or restoring to a safe condition of any portion of a building or structure declared unsafe by a proper authority.

9.1.2 No building devoted to a non-conforming use shall be enlarged or extended unless the use therein is changed to a conforming use. No building devoted to a non-conforming use shall be structurally altered or improved to accommodate such use if the total cost of any or all such changes exceeds 50% of the reproduction value of the building at the time of application for the first change.

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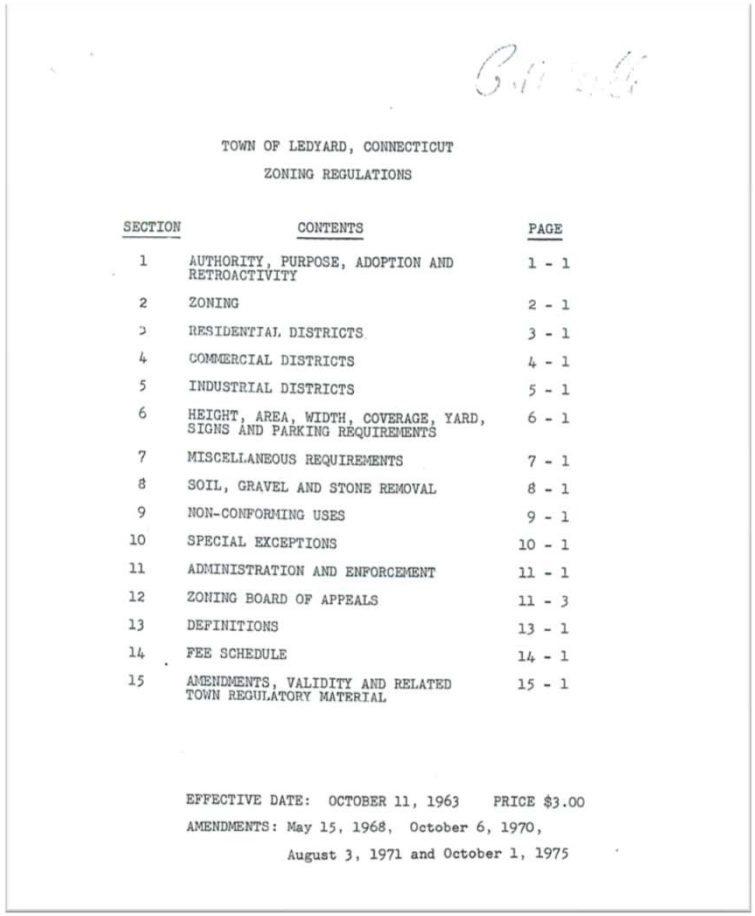
Exhibit A

1963 ZONING REGULATIONS

GFI Response:



TOWN OF LEDYARD, CONNECTICUT

ZONING REGULATIONS

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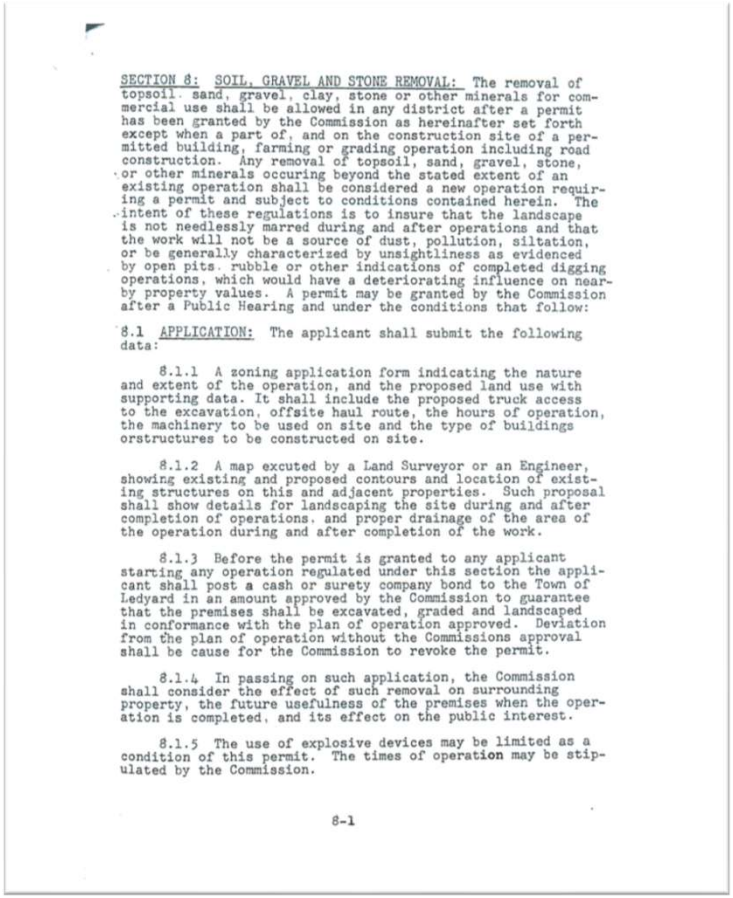
EFFECTIVE DATE: OCTOBER 11, 1963 PRICE $3.00

AMENDMENTS: May 15, 1968, October 6, 1970,
August 3, 1971 and October 1, 1975

Exhibit B

APPLICABLE PROVISIONS OF THE 1975 ZONING REGULATIONS

GFI Response:



SECTION 8: SOIL, GRAVEL AND STONE REMOVAL: The removal of topsoil, sand, gravel, clay, stone or other minerals for commercial use shall be allowed in any district after a permit has been granted by the Commission as hereinafter set forth except when a part of, and on the construction site of a permitted building, farming or grading operation including road construction. Any removal of topsoil, sand, gravel, stone, or other minerals occuring beyond the stated extent of an existing operation shall be considered a new operation requiring a permit and subject to conditions contained herein. The intent of these regulations is to insure that the landscape is not needlessly marred during and after operations and that the work will not be a source of dust, pollution, siltation, or be generally characterized by unsightliness as evidenced by open pits, rubble or other indications of completed digging operations, which would have a deteriorating influence on nearby property values. A permit may be granted by the Commission after a Public Hearing and under the conditions that follow:

8.1 APPLICATION: The applicant shall submit the following data:

8.1.1 A zoning application form indicating the nature and extent of the operation, and the proposed land use with supporting data. It shall include the proposed truck access to the excavation, offsite haul route, the hours of operation, the machinery to be used on site and the type of buildings orstructures to be constructed on site.

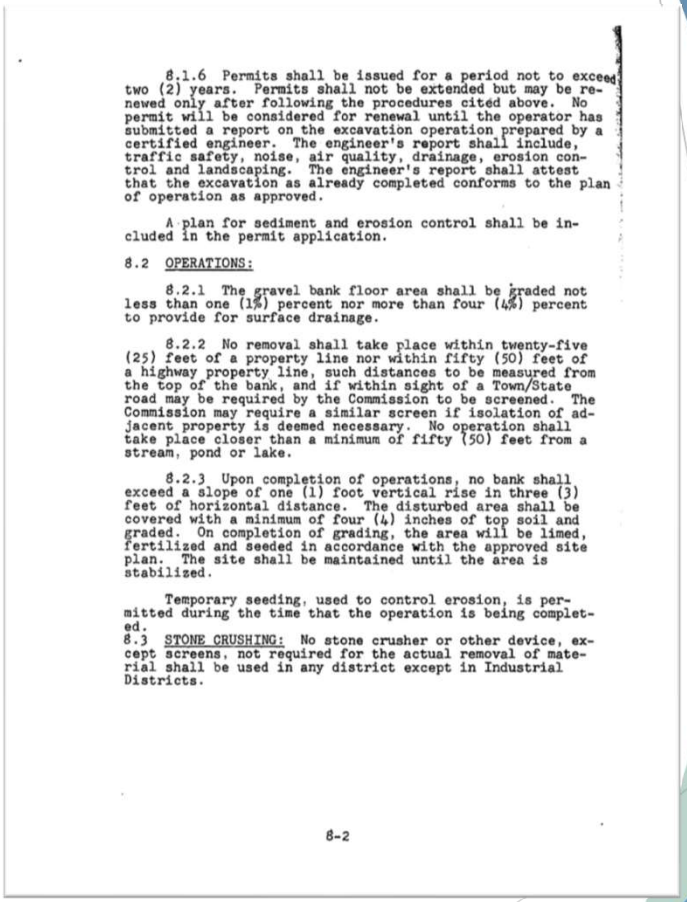
8.1.2 A map excuted by a Land Surveyor or an Engineer, showing existing and proposed contours and location of existing structures on this and adjacent properties. Such proposal shall show details for landscaping the site during and after completion of operations, and proper drainage of the area of the operation during and after completion of the work.

8.1.3 Before the permit is granted to any applicant starting any operation regulated under this section the applicant shall post a cash or surety company bond to the Town of Ledyard in an amount approved by the Commission to guarantee that the premises shall be excavated, graded and landscaped in conformance with the plan of operation approved. Deviation from the plan of operation without the Commissions approval shall be cause for the Commission to revoke the permit.

8.1.4 In passing on such application, the Commission shall consider the effect of such removal on surrounding property, the future usefulness of the premises when the operation is completed, and its effect on the public interest.

8.1.5 The use of explosive devices may be limited as a condition of this permit. The times of operation may be stipulated by the Commission.

8-1



8.1.6 Permits shall be issued for a period not to exceed two (2) years. Permits shall not be extended but may be renewed only after following the procedures cited above. No permit will be considered for renewal until the operator has submitted a report on the excavation operation prepared by a certified engineer. The engineer's report shall include, traffic safety, noise, air quality, drainage, erosion control and landscaping. The engineer's report shall attest that the excavation as already completed conforms to the plan of operation as approved.

A plan for sediment and erosion control shall be included in the permit application.

8.2 OPERATIONS:

8.2.1 The gravel bank floor area shall be graded not less than one (1%) percent nor more than four (4%) percent to provide for surface drainage.

8.2.2 No removal shall take place within twenty-five (25) feet of a property line nor within fifty (50) feet of a highway property line, such distances to be measured from the top of the bank, and if within sight of a Town/State road may be required by the Commission to be screened. The Commission may require a similar screen if isolation of adjacent property is deemed necessary. No operation shall take place closer than a minimum of fifty (50) feet from a stream, pond or lake.

8.2.3 Upon completion of operations, no bank shall exceed a slope of one (1) foot vertical rise in three (3) feet of horizontal distance. The disturbed area shall be covered with a minimum of four (4) inches of top soil and graded. On completion of grading, the area will be limed, fertilized and seeded in accordance with the approved site plan. The site shall be maintained until the area is stabilized.

Temporary seeding, used to control erosion, is permitted during the time that the operation is being completed.

8.3 STONE CRUSHING: No stone crusher or other device, except screens, not required for the actual removal of material shall be used in any district except in Industrial Districts.

8-2

Exhibit B

APPLICABLE PROVISIONS OF THE 1975 ZONING REGULATIONS

Commission Question:

In regards to radon exposure, does depth matter? I.e. do we encounter more radon at deeper levels within the bedrock and layers?

GFI Response:

Yes, depth, in terms of excavation, can influence the potential for the radon present. Radon, where present with regards to bedrock, is going to present primarily in fractured bedrock. The uppermost 25 feet of bedrock will typically contain more open and weathered fractures and have a higher potential for radon than at increased depths. The rock core borings that were completed show that the number and frequency of fractures in the granite decrease significantly at depth.

Response provided by Jeff Slade, Senior Geologist with Continental Placer/Adirondack Consulting Services

Commission Question:

Maine Drilling and Blasting response to letter read from Lara Stauning from the 12/5 meeting: Is there a report to corroborate their comments in regards to vibration levels?
Does this report come from monitoring equipment?

GFI Response:

YOUR TRUSTED BREED
making it happen

MAINE DRILLING & BLASTING, INC. – RESPONSE LETTER

December 16, 2024

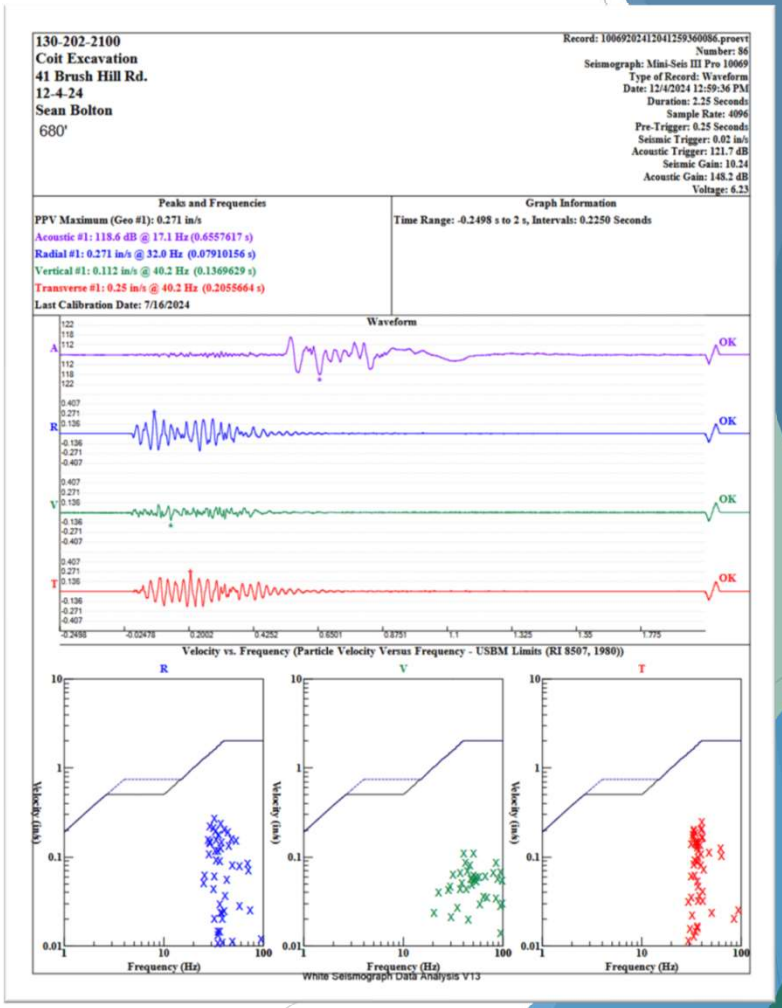
To Whom it May Concern,

This letter is in response to the Planning and Zoning Public Hearing-Special Meeting notes dated December 12, 2024. Maine Drilling & Blasting, Inc. (MDB) is responding to question 4 submitted by 24-8SUP24-9CAM Commissioner Ribe PZC GFI Questions 12-13-24.

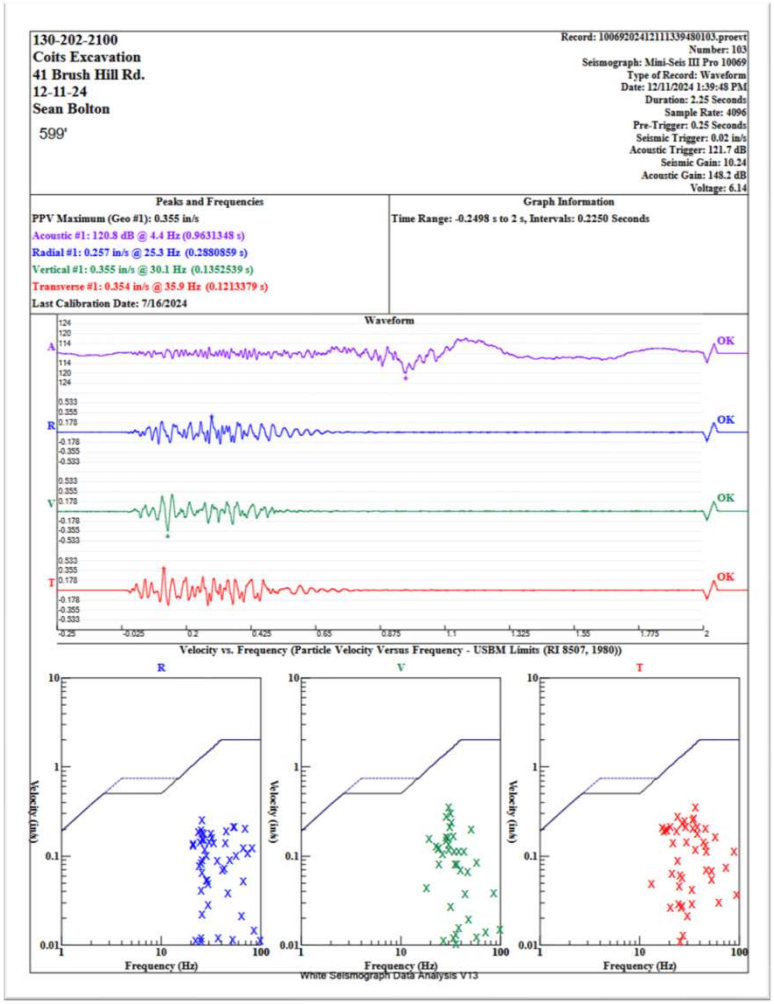
"Maine Drilling and Blasting response to letter read from Lara Stauning from the 12/5 meeting: Is there a report to corroborate their comments in regards to vibration levels? Does this report come from monitoring equipment?"

- All seismographs are calibrated yearly in accordance with NFPA 495 11.1.3 "Blasting seismographs used to monitor ground vibration and air overpressure shall comply with the ISEE document. "Performance Specifications for Blasting Seismographs."
- All MDB employees setting up seismographs have been trained in the proper usage and set up according to NFPA 11.1.4 "Where used, blasting seismographs shall be deployed in the field according to the ISEE document, "Field Practice Guidelines for Blasting Seismographs."
- We are currently blasting near Lara Stauning's home at 41 Brush Hill Rd. Attached are the last 3 blasts on the Coyt project in Bozrah, CT.
  12-4 680' 0.271 ppv @ 32 hz
  12-11 599' 0.355 ppv @ 30.1 hz
  12-16 619' 0.444 ppv @ 34.1 hz

Sincerely,
Tim Harmon
MDB



GFI Response:



130-202-2100
Coits Excavation
41 Brush Hill Rd.
12-11-24
Sean Bolton
599'

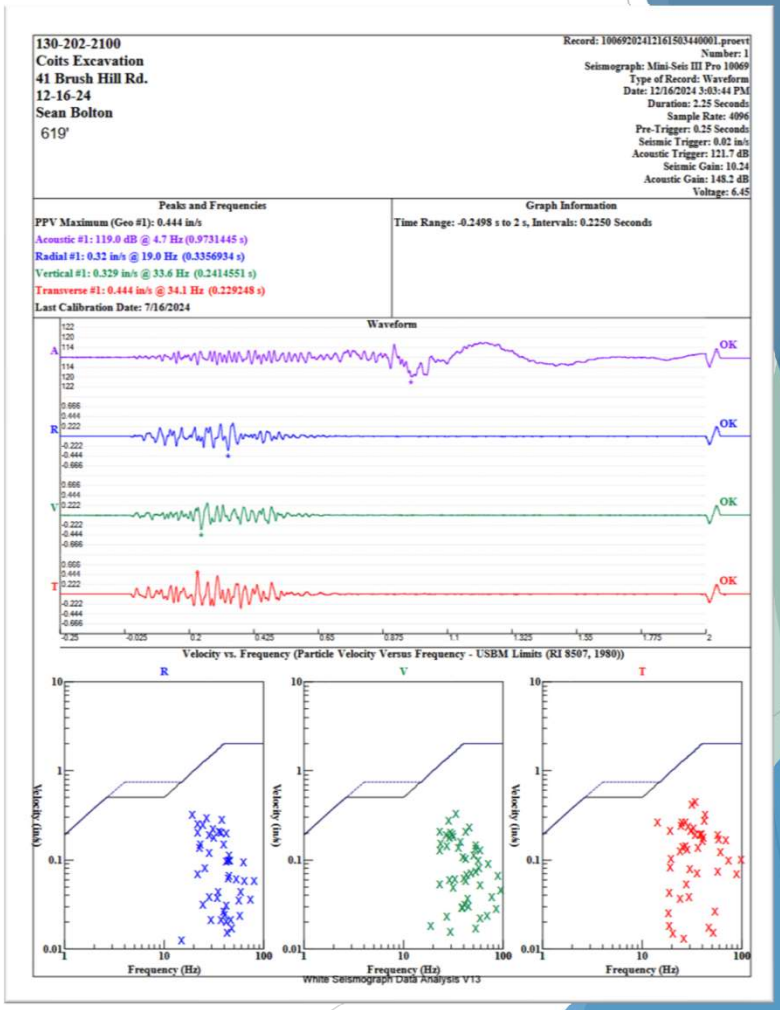
Record: 10069202412111339480103.proevt
Number: 103
Seismograph: Mini-Seis III Pro 10069
Type of Record: Waveform
Date: 12/11/2024 1:39:48 PM
Duration: 2.25 Seconds
Sample Rate: 4096
Pre-Trigger: 0.25 Seconds
Seismic Trigger: 0.02 in/s
Acoustic Trigger: 121.7 dB
Seismic Gain: 10.24
Acoustic Gain: 148.2 dB
Voltage: 6.14

Peaks and Frequencies	Graph Information
PPV Maximum (Geo #1): 0.355 in/s	Time Range: -0.2498 s to 2 s, Intervals: 0.2250 Seconds
Acoustic #1: 120.8 dB @ 4.4 Hz (0.9631348 s)	
Radial #1: 0.257 in/s @ 25.3 Hz (0.2880859 s)	
Vertical #1: 0.355 in/s @ 30.1 Hz (0.1352539 s)	
Transverse #1: 0.354 in/s @ 35.9 Hz (0.1213379 s)	
Last Calibration Date: 7/16/2024	

Waveform

Velocity vs. Frequency (Particle Velocity Versus Frequency - USBM Limits (RI 8507, 1980))

White Seismograph Data Analysis V13



130-202-2100
Coits Excavation
41 Brush Hill Rd.
12-16-24
Sean Bolton
619'

Record: 10069202412161503440001.proevt
Number: 1
Seismograph: Mini-Seis III Pro 10069
Type of Record: Waveform
Date: 12/16/2024 3:03:44 PM
Duration: 2.25 Seconds
Sample Rate: 4096
Pre-Trigger: 0.25 Seconds
Seismic Trigger: 0.02 in/s
Acoustic Trigger: 121.7 dB
Seismic Gain: 10.24
Acoustic Gain: 148.2 dB
Voltage: 6.45

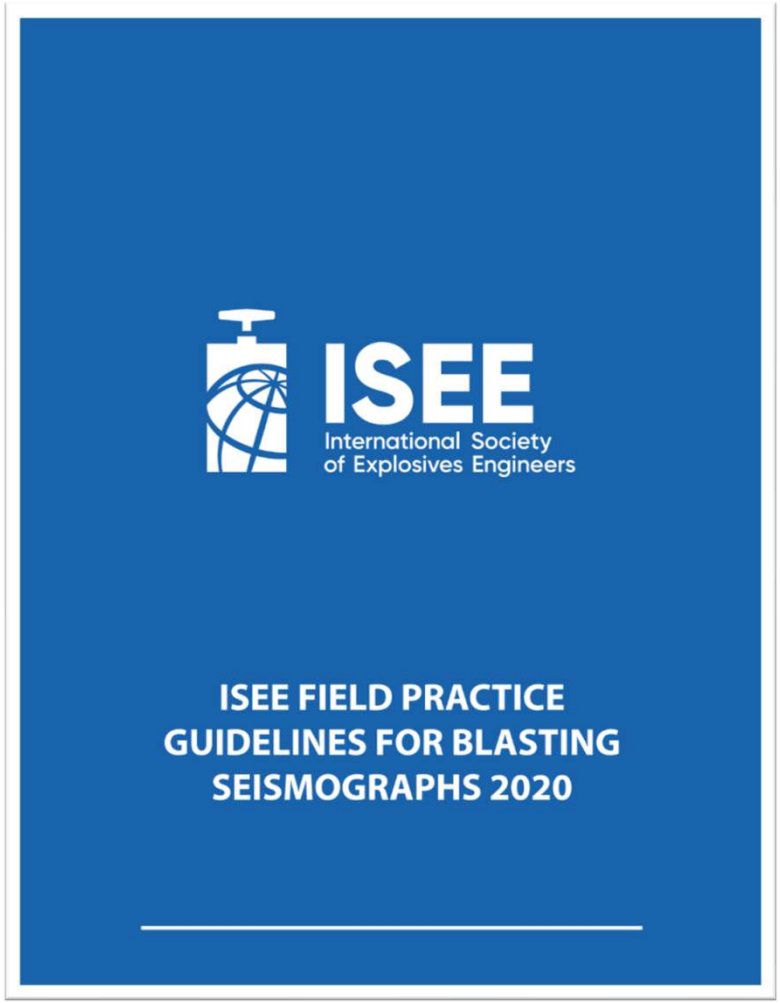
Peaks and Frequencies	Graph Information
PPV Maximum (Geo #1): 0.444 in/s	Time Range: -0.2498 s to 2 s, Intervals: 0.2250 Seconds
Acoustic #1: 119.0 dB @ 4.7 Hz (0.9731445 s)	
Radial #1: 0.32 in/s @ 19.0 Hz (0.3356934 s)	
Vertical #1: 0.329 in/s @ 33.6 Hz (0.2414551 s)	
Transverse #1: 0.444 in/s @ 34.1 Hz (0.229248 s)	
Last Calibration Date: 7/16/2024	

Waveform

Velocity vs. Frequency (Particle Velocity Versus Frequency - USBM Limits (RI 8507, 1980))

White Seismograph Data Analysis V13

GFI Response:



Published By
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Cleveland, OH 44128 USA
www.isee.org

This edition of *ISEE Field Practice Guidelines for Blasting Seismographs* was revised by the ISEE Standards Committee in 2020, and supersedes all previous editions. It was approved by the Society's Board of Directors in its role of Secretariat of the Standards at its 2020 meeting.

International Society of Explosives Engineers (ISEE) – Standards Committee Members[1]
Chairman, Kenneth K Eltschlager, U.S. Office of Surface Mining Reclamation and Enforcement
Mark Dean, Texcel Pty Ltd
Steven DelloRusso, Simpson Gumpertz & Heger Inc.
Alastair Grogan, Grogan Rock Consulting Ltd.
Michael Mann, Ohio Department of Natural Resources
Douglas Rudenko, Vibra-Tech Engineers, Inc.
Pablo Segarra, Universidad Politécnica de Madrid
Robert Turnbull, Instantel
Randall Wheeler, White Industrial Seismology
Board Liaison, Douglas Hoy, Sayre Associates, Inc

[1]This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred.

Committee Scope: This Committee shall have primary responsibility for documents on the manufacture, transportation, storage, and use of explosives and related materials. This Committee does not have responsibility for documents on consumer and display fireworks, model and high power rockets and motors, and pyrotechnic special effects.

Origin and Development of ISEE Standards for Blasting Seismographs
One of the goals of the ISEE Standards Committee is to develop uniform and technically appropriate standards for blasting seismographs. The intent is to improve accuracy and consistency in vibration and air overpressure measurements. Blasting seismograph performance is affected by how the blasting seismograph is built and how it is placed in the field.

In 1994, questions were raised about the accuracy, reproducibility and defensibility of data from blasting seismographs. To address this issue, the International Society of Explosives Engineers (ISEE) established a Seismograph Standards Subcommittee at its annual conference held in February 1995. The committee was comprised of seismograph manufacturers, researchers, regulatory personnel and seismograph users.
In 1997, the Committee became the Blast Vibrations and Seismograph Section. The initial standards were drafted and approved by the Section in December 1999. Subsequently, the ISEE Board of Directors approved two standards in the year 2000: 1) ISEE Field Practice Guidelines for Blasting Seismographs; and 2) Performance Specifications for Blasting Seismographs.

In 2002, the Society established the ISEE Standards Committee. A review of the ISEE Field Practice Guidelines and the Performance Specifications for Blasting Seismographs fell within the scope of the Committee. Work began on a review of the Field Practice Guidelines in January 2006 and was completed in February 2008 to produce the 2009 edition. A revision to the Performance Specifications was started in 2009 and completed in 2011.

The ISEE Standards Committee takes on the role of keeping the standards up to date every 5 years. This document is the result of the latest effort by the ISEE Standards Committee to keep the standards up to date with current field techniques and technology.

GFI Response:

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Disclaimer: These field practice recommendations are intended to serve as general guidelines and cannot describe all types of field conditions. It is important that the operator evaluate these conditions and obtain good coupling between the monitoring instrument and the surface to be monitored. In all cases, the operator is responsible for documenting the field conditions and setup procedures in the permanent record for each blast.

PREFACE

Blasting seismographs are used to establish compliance with Federal, state and local regulations and evaluate explosive performance. Laws and regulations have been established to prevent damage to property and injury to people. The disposition of the rules is strongly dependent on the accuracy of ground vibration and air overpressure data. In terms of explosive performance the same holds true. One goal of the ISEE Standards Committee is to ensure consistent recording of ground vibrations and air overpressure between all blasting seismographs.

ISEE Field Practice Guidelines for Blasting Seismographs 2020 Edition

PART I. GENERAL GUIDELINES

Blasting seismographs are deployed in the field to record the levels of blast-induced ground vibration and air overpressure. Accuracy of the recordings is essential. These guidelines define the user's responsibilities when deploying blasting seismographs in the field and assume that the blasting seismographs conform to the ISEE "Performance Specifications for Blasting Seismographs" [3].

1. Read the instruction manual and be familiar with the operation of the instrument. Every seismograph comes with an instruction manual. Users are responsible for reading the appropriate sections and understanding the proper operation of the instrument before monitoring a blast.

2. Seismograph calibration. Annual calibration of the seismograph is recommended.

3. Keep proper blasting seismograph records. A user's log should note: the user's name, date, time, place and other pertinent data.

4. Document the location of the seismograph. This includes the name of the structure and where the seismograph was placed on the property relative to the structure. Any person should be able to locate and identify the exact monitoring location at a future date.

5. Know and record the distance to the blast. The horizontal distance from the seismograph to the blast should be known to at least two significant digits. For example, a blast within 1000 meters or feet would be measured to the nearest tens of meters or feet respectively and a blast within 10,000 meters or feet would be measured to the nearest hundreds of feet or meters respectively. Where elevation changes exceed 2.5 horizontal:1 vertical, slant distances or true distance should be used.

6. Record the blast. When seismographs are deployed in the field, the time spent deploying the unit justifies recording an event. As practical, set the trigger levels low enough to record each blast.

7. Record the full time history waveform. Summary or single peak value recording options available on many seismographs should not be used for

GFI Response:

monitoring blast generated vibrations. Operating modes that report peak velocities over a specified time interval are not recommended when recording blast induced vibrations.

8. Set the sampling rate. The blasting seismograph should be programmed to record the entire blast event in enough detail to accurately reproduce the vibration trace. In general the sample rate should be at least 1000 samples per second.

9. Know the data processing time of the seismograph. Some units take up to 5 minutes to process and print data. If another blast occurs within this time the second blast may be missed.

10. Know the memory or record capacity of the seismograph. Enough memory must be available to store the event. The full waveform should be saved for future reference in either digital or analog form.

11. Know the nature of the report that is required. For example, provide a hard copy in the field; keep digital data as a permanent record or both. If an event is to be printed in the field, a printer with paper is needed.

12. Allow ample time for proper setup of the seismograph. Many errors occur when seismographs are hurriedly set up. Generally, more than 15 minutes for set up should be allowed from the time the user arrives at the monitoring location until the blast.

13. Know the temperature. Seismographs have varying manufacturer specified operating temperatures.

14. Secure cables. Suspended or freely moving cables from the wind or other extraneous sources can produce false triggers due to microphonics.

PART II. GROUND VIBRATION MONITORING

Placement and coupling of the vibration sensor are the two most important factors to ensure accurate ground vibration recordings.

A. Sensor Placement

The sensor should be placed on or in the ground on the side of the structure towards the blast. A structure can be a house, pipeline, telephone pole, etc. Measurements on driveways, walkways, and slabs are to be avoided where possible.

1. Location relative to the structure. Sensor placement should ensure that the data obtained adequately represents the ground-borne vibration levels received at the structure. The sensor should be placed within 3.05 meters (10 feet) of the structure or less than 10% of the distance from the blast, whichever is less.

2. Soil density evaluation. The soil should be undisturbed or compacted fill. Loose fill material, unconsolidated soils, flower-bed mulch or other

unusual mediums may have an adverse influence on the recording accuracy.

3. The sensor must be nearly level.

4. Typical practice is to point the longitudinal/radial channel towards the blast site. However, other sensor orientations are allowed.

a. For blast-by-blast sensor deployment, the longitudinal/radial channel should be pointed towards the closest blast hole. Records should indicate if this condition is met.

b. For multiple-blast sensor deployment, the azimuth (0-360 degrees, +/- 5 degrees) of the longitudinal/radial channel relative to true north should be recorded.

5. Where access to a structure and/or property is not available, the sensor should be placed closer to the blast in undisturbed soil.

B. Sensor Coupling

If the acceleration exceeds 1.96 m/s² (0.2 g), decoupling of the sensor may occur. Depending on the anticipated acceleration levels spiking, burial, or sandbagging of the geophone to the ground may be appropriate.

1. If the acceleration is expected to be:

a. Less than 1.96 m/s² (0.2 g), no burial or attachment is necessary.

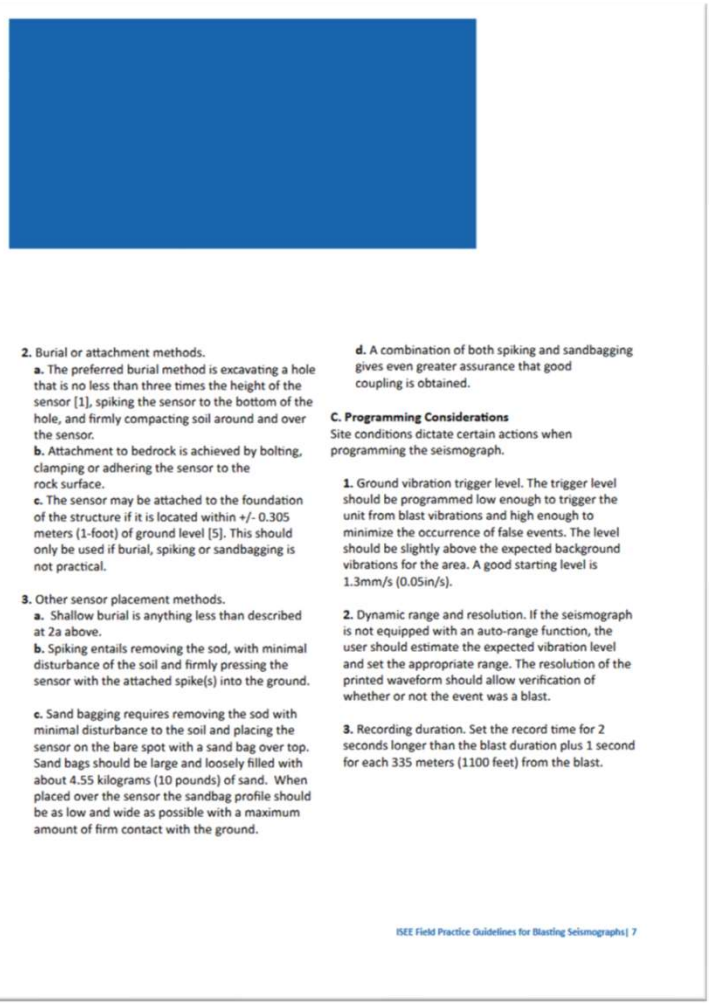
b. Between 1.96 m/s² (0.2 g), and 9.81 m/s² (1.0 g), burial or attachment is preferred. Spiking may be acceptable.

c. Greater than 9.81 m/s² (1.0 g) , burial or firm attachment is required [7].

The following table exemplifies the particle velocities and frequencies where accelerations are 1.96 m/s² (0.2 g) and 9.81 m/s² (1.0 g).

Frequency, Hz	4	10	15	20	25	30	40	50	100	200
Particle Velocity mm/s (in/s) at 1.96 m/s² (0.2 g)	78.0 (3.07)	31.2 (1.23)	20.8 (0.82)	15.6 (0.61)	12.5 (0.49)	10.4 (0.41)	7.8 (0.31)	6.2 (0.25)	3.1 (0.12)	1.6 (0.06)
Particle Velocity mm/s (in/s) at 9.81 m/s² (1.0 g)	390 (15.4)	156 (6.14)	104 (4.10)	78.0 (3.07)	62.4 (2.46)	52.0 (2.05)	39.0 (1.54)	31.2 (1.23)	15.6 (0.61)	7.8 (0.31)

GFI Response:



2. Burial or attachment methods.
   a. The preferred burial method is excavating a hole that is no less than three times the height of the sensor [1], spiking the sensor to the bottom of the hole, and firmly compacting soil around and over the sensor.
   b. Attachment to bedrock is achieved by bolting, clamping or adhering the sensor to the rock surface.
   c. The sensor may be attached to the foundation of the structure if it is located within +/- 0.305 meters (1-foot) of ground level [5]. This should only be used if burial, spiking or sandbagging is not practical.

3. Other sensor placement methods.
   a. Shallow burial is anything less than described at 2a above.
   b. Spiking entails removing the sod, with minimal disturbance of the soil and firmly pressing the sensor with the attached spike(s) into the ground.

   c. Sand bagging requires removing the sod with minimal disturbance to the soil and placing the sensor on the bare spot with a sand bag over top. Sand bags should be large and loosely filled with about 4.55 kilograms (10 pounds) of sand. When placed over the sensor the sandbag profile should be as low and wide as possible with a maximum amount of firm contact with the ground.

   d. A combination of both spiking and sandbagging gives even greater assurance that good coupling is obtained.

C. Programming Considerations
Site conditions dictate certain actions when programming the seismograph.

1. Ground vibration trigger level. The trigger level should be programmed low enough to trigger the unit from blast vibrations and high enough to minimize the occurrence of false events. The level should be slightly above the expected background vibrations for the area. A good starting level is 1.3mm/s (0.05in/s).

2. Dynamic range and resolution. If the seismograph is not equipped with an auto-range function, the user should estimate the expected vibration level and set the appropriate range. The resolution of the printed waveform should allow verification of whether or not the event was a blast.

3. Recording duration. Set the record time for 2 seconds longer than the blast duration plus 1 second for each 335 meters (1100 feet) from the blast.

PART III. AIR OVERPRESSURE MONITORING

Placement of the microphone relative to the structure is the most important factor.

A. Microphone Placement
The microphone should be placed along the side of the structure, nearest the blast.

1. The microphone should be mounted near the geophone with the manufacturer's wind screen attached.

2. The microphone may be placed at any height above the ground [2].

3. If practical, the microphone should not be shielded from the blast by nearby buildings, vehicles or other large barriers. If such shielding cannot be avoided, the horizontal distance between the microphone and shielding object should be greater than the height of the shielding object above the microphone.

4. If placed too close to a structure, the air overpressure may reflect from the house surface and record higher amplitudes. Structure response noise may also be recorded. Reflection can be minimized by placing the microphone near a corner of the structure. [6].

5. The orientation of the microphone is not critical for air overpressure frequencies below 1,000 Hz [6].

6. The microphone element must be kept dry to help maintain proper calibration and minimize the potential for corrosion. A common practice is to place a windscreen (typically provided by the manufacturer) on the microphone and cover it loosely with a thin plastic bag, or "rain shield." Other methods can be used to protect the microphone from moisture; however, the pressure around the microphone sensing element must be able to change in relation to the pressure change caused by the blast overpressure.

   a. When using a plastic bag as a rain shield, the bag should be tied loosely around the microphone, allowing some exchange of air between the inside and outside of the shield. Completely sealing a rain shield could result in the following:

      i. **Condensation –** water accumulates inside the shield. A small hole in the bottom of the shield can help mitigate this issue.
      ii. **Static Pressure –** over time pressure could build in the shield.
      iii. **Rain Triggers –** rain drops striking a tightly sealed shield will cause pressure pulses that could trigger the seismograph.

   b. It is acceptable to keep microphones inside security boxes or other protective covers as long as the pressure change in the enclosure reflects the pressure change outside of the protective cover in the surrounding environment.

GFI Response:

B. Programming Considerations
Site conditions dictate certain actions when programming the seismograph to record air overpressure.

1. Trigger Level – When only an air overpressure measurement is desired, the trigger level should be low enough to trigger the unit from the air overpressure and high enough to minimize the occurrence of false events. The level should be slightly above the expected background noise for the area. A good starting level is 20 Pa (0.20 millibars or 120 dB).

2. Recording Duration – When only recording air overpressure, set the recording time for at least 2 seconds more than the blast duration. When ground vibrations and air overpressure measurements are desired on the same record, follow the guidelines for ground vibration programming (Part II C.3).

REFERENCES

1. American National Standards Institute, Vibration of Buildings – Guidelines for the Measurement of Vibrations and Evaluation of Their Effects on Buildings. ANSI S2.47-1990, R1997.

2. Eltschlager, K. K., White, R. M. Microphone Height Effects on Blast-Induced Air Overpressure Measurements, 31st Annual Conference on Explosives and Blasting Technique, International Society of Explosives Engineers, 2005.

3. International Society of Explosives Engineers. ISEE Performance Specifications for Blasting Seismographs, 2011.

4. Siskind, D. E., Stagg, M. S., Kopp, J. W., Dowding, C. H. Structure Response and Damage by Ground Vibration From Mine Blasting. US Bureau of Mines Report of Investigations 8507, 1980.

5. Siskind, D. E., Stagg, M. S. Blast Vibration Measurements Near and On Structure Foundations, US Bureau of Mines Report of Investigations 8969, 1985.

6. Stachura, V. J., Siskind, D. E., Engler, A. J., Airblast Instrumentation and Measurement for Surface Mine Blasting, US Bureau of Mines Report of Investigations 8508, 1981.

7. Stagg, M. S., Engler, A. J., Measurement of Blast –Induced Ground Vibrations and Seismograph Calibration, US Bureau of Mines Report of Investigations 8506, 1980.

Commission Question:

How many barges departed and arrived during Dow's heyday?

GFI Response:

To the best of our knowledge, The Dow Chemical Company did not employ barges. Beginning in 1956, and continuing to this date, raw material was provided to The Dow Chemical Company and now Americas Styrenics by tankers, not barges. The “Marine Dow Chemical” was a 551 foot tanker, the first vessel built for carrying liquid chemicals with a capacity of 3.5 million gallons. The S.S. Leland I. Doan, with a capacity of 3.7 million gallons took her maiden voyage in February, 1961. Both tankers transported liquid chemical product to The Dow Chemical Company manufacturing facility at Allyn’s Point. 1 – 2 tankers arrived each month with product.

Response provided by Harry B. Heller

Commission Question:

How many barges are expected/ anticipated to arrive and depart at GFI over the course of 10 yrs?

GFI Response:

It is anticipated that 2 – 3 barges per week will be utilized during periods of peak excavation to transport stone product from the Allyn's Point property to market. The tanker which provides raw material for manufacturing to Americas Styrenics ports approximately once every 6 – 7 weeks.

Response provided by Harry B. Heller

Commission Question:

How is it possible that 100% of silica dust can be prevented from leaving the boundaries of the property?

GFI Response:

Silica is one of the most common elements in the earth's crust and is found in road sand, at the beach, in construction materials like bricks and tiles. It was presented in the Geology expert report that the concentration of silica in the proposed quarry material is low.

Even so, the GFI project related particulate/dust, including silica, will be subject to continuous measurement and engineered controls that will be in place for the duration of the project. The engineered controls, which will include but not be limited to the use of water misting at the point sources, will be designed to minimize particulate/dust generation or emissions, including potential silica dust. The current proposed engineered controls have been shown by industry experience and in the peer reviewed technical literature to be relatively easy to implement and highly effective at controlling particulate/dust emissions from sites.

GFI Response:

The Community Air Monitoring Program (CAMP) Verdantas prepared for operations at GFI includes continuous real time perimeter monitoring for particulate matter with aerodynamic diameters of 2.5 µm and 10 µm, respectively. The CAMP provides specific response actions in the event perimeter particulate concentrations reach a predetermined threshold concentration, which will be set at 100 times below the permissible exposure limit (PEL) in the occupational environment.

In addition, the Mine Safety and Health Administration (MSHA) requires exposure assessment(s) of the on-site affected personnel, with an additional requirement to report results to the agency within an MSHA prescribed period of time. The MSHA health-based threshold concentration for silica particulate/dust is 50 micrograms per cubic meter of air (µg/m3) averaged over an 8-hour time period. The health-based concentration thresholds established by MSHA for the workers provides the required protection for occupational and public health such that the workers may work in the operational areas (emission source areas) without the need for using personal protective equipment for breathing (i.e., respirators, dust masks, or similar).

GFI Response:

In summary, the process engineered controls coupled with continuous real time monitoring at the perimeter of the site (CAMP) and required integrated air samples for analysis of crystalline silica dust for workers at the site (MSHA) will provide scientific data to verify, with a high degree of confidence, that dust emissions, including emissions of silica dust, will be below health-based thresholds both on-site and in the surrounding community.

Response provided by Suzanne Pisano of Verdantas

Health & Safety

- Respirable Dust and Silica will be monitored and tested to assure they stay below the Permissible Exposure Limit (PEL) and Action Level.
- Monitoring is performed using personal dust monitors to sample the air surrounding the employee to make sure that all levels are below PEL and the Action Level.
- All testing samples are sent to a certified laboratory for analysis.

Commission Question:

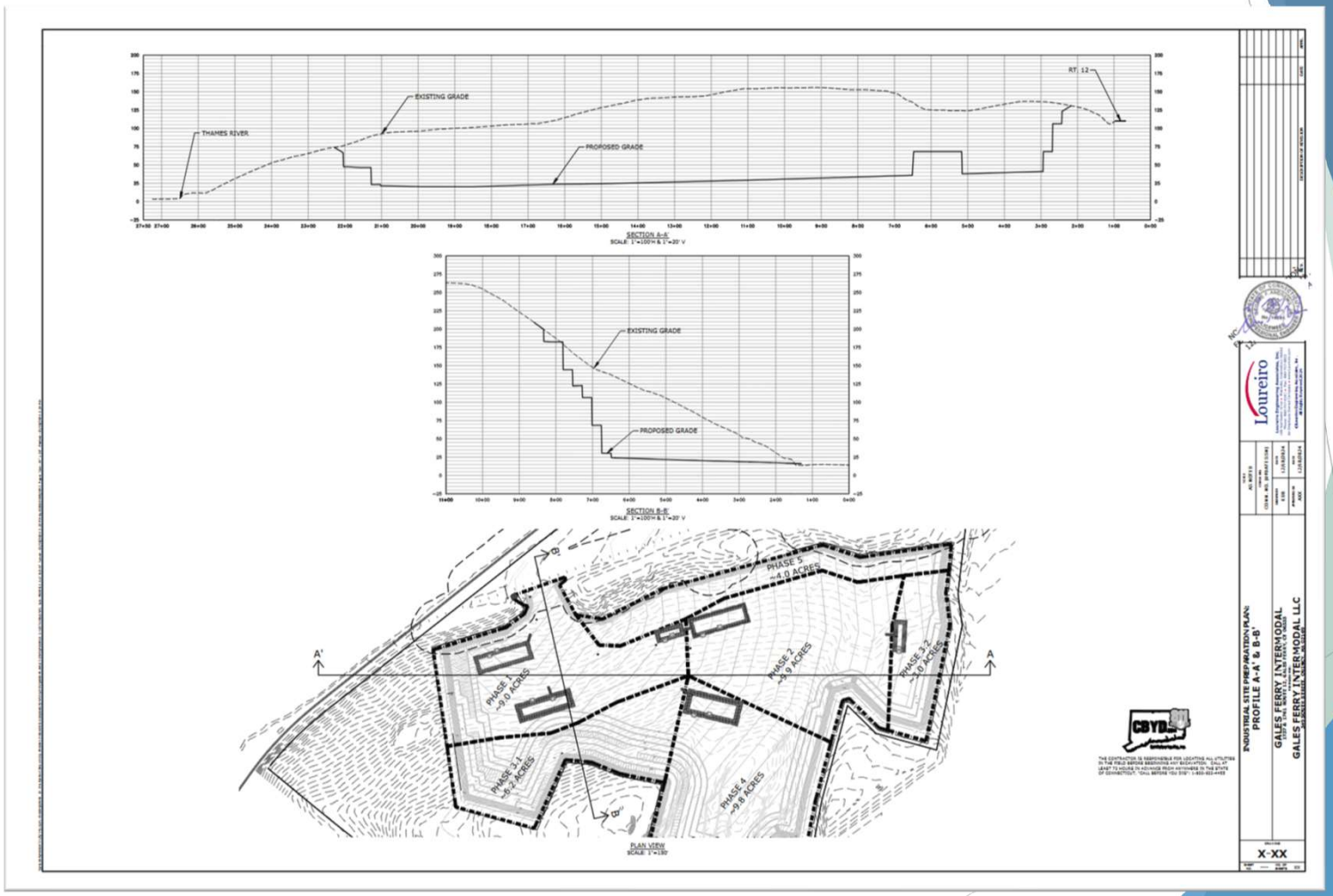
Please demonstrate in detail and in laymen's perspective the final grading depiction resulting from the regrading processes in this application. Please include the part of the property that extends from Route 12 and down to the Thames River. Please use existing plans as necessary and any other means to clearly show the resulting gradation.

GFI Response:

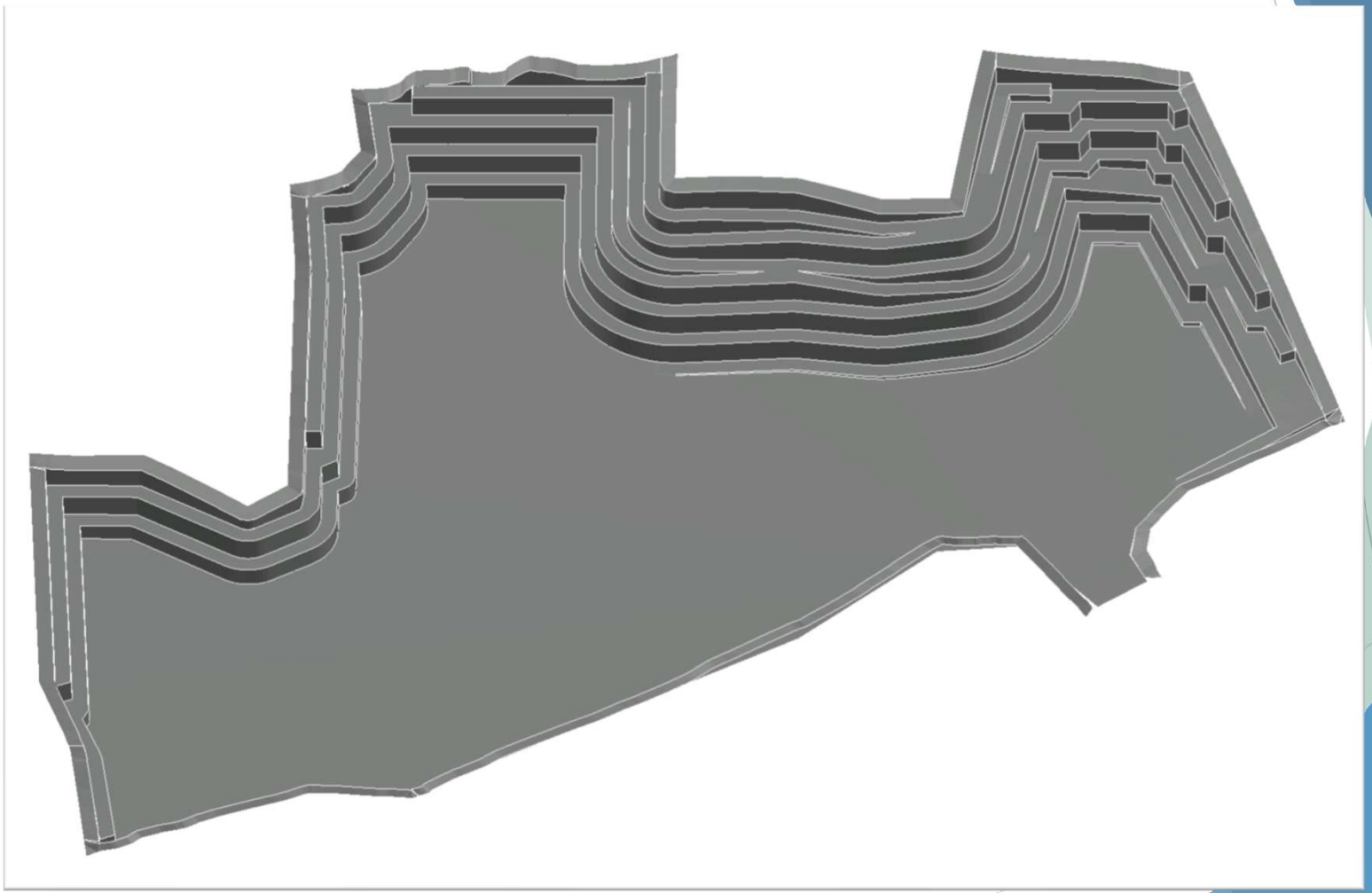
See Section Views East to West (A-A') and North to South (B-B') attached prepared by Loureiro Engineering Associates, Inc. as well as a 3 dimensional drawing prepared by Loureiro Engineering Associates, Inc. to portray the final grading for the project after all 5 phases have been completed. Please note that cross section detail B-B' depicted on Drawing Sheet XS-1 evidences an elevation of 90 +/- at Route 12 with the finished grade ascending at Station 21+60 at the westerly edge of the excavation to elevation 100 +/-, a 10 foot rise in elevation. The finished grade then benches down to elevation 40 at the floor of the excavation which descends to the west to a finished floor elevation of 20 +/- at the westerly floor of the excavation at its west end. The approximate 1.5% finished grade has been designed to support future industrial development as represented by the Applicant.

Response provided by Harry B. Heller and George Andrews of Loureiro Engineering Associates, Inc.

GFI Response:



GFI Response:



Commission Question:

Please describe or reiterate in detail the closure plan for each phase, including timing and timelines.

GFI Response:

Once the first phase of excavation is complete, the surface will be backfilled to subgrade, which is the final grade minus the topsoil and subsoil layers. The interim surface will be stabilized with crushed stone to facilitate vehicular traffic, while mitigating soil erosion during this interim operating period. This interim surface will be maintained in Phase 1 through Phases 2 through 4. Phase 2 will be similarly handled to facilitate the continued excavation of overburden and bedrock and to provide access to the later phases. Assuming an 8-year construction period, Phases 1 and 2 will likely be in the interim stabilization state for about 7-years. We expect Phases 1 and 2 to be stabilized at subgrade within about 3.5 years from the start of construction.

GFI Response:

Phases 3.1, 3.2 and 4 will not need this interim crushed stone finish as these areas will be at final subgrade without the need for vehicular traffic thereover. These phases will immediately be restored with 12-20” of subsoil and 4” of topsoil on the floor and 30” of subsoil and 4” of topsoil on the benches, then mulched and seeded/planted. Restoration of these phases would progress phase by phase over a period of about 3.5-years.

At year 7 or thereabouts, Phase 5 will be excavated (no blasting anticipated since this area will be overburden soils only). Phase 5 will immediately be restored with subsoil and topsoil, then mulched and seeded. We expect this excavation and restoration to endure for about 6-months.

Upon completion of Phase 5, phase 2 will be restored to final grade with subsoil and topsoil, mulched and seeded. Upon completion, Phase 1 will be restored with the same finish. We expect Phase 1 and 2 to be completely restored at the 8-year period.

Response provided by Loureiro Engineering Associates, Inc.

Commission Question:

Processing of rock and regrading as proposed is characterized as “industrial site preparation. Have other permits including site plans been submitted for either this application or under a separate application?

GFI Response:

The only other related application was the application which was approved for a permit to conduct regulated activities by the Ledyard Inland Wetlands and Watercourses Commission. The application which is currently being presented to the Town of Ledyard Planning and Zoning Commission for consideration is (i) an Application for Special Permit for Excavation Major and for modification of an existing Special Permit granted by the Town of Ledyard Planning and Zoning Commission for mixed commercial and industrial use of the subject property (ii) a Site Plan application submitted in conjunction with the Special Permit Application to approve the proposed regrading of the property which will result from the activities identified in the Ledyard Zoning Regulations as “Excavation Major” and (iii) an application for a determination of consistency with coastal goals and policies.

GFI Response:

The use identified in the Zoning Regulations as a use permitted by special permit is an Excavation Major; i.e. the excavation and removal of more than 300 cubic yards of earth product material. That is the use applied for in this application. The purpose of that use, as depicted in the permit application as well as the Zoning Compliance Manual, is to accomplish the industrial regrading of 40 acres of the Applicant's property in order to create 26 acres of unencumbered valuable industrial land to support future development.

Thus, the specially permitted use as identified in the Ledyard Zoning Regulations enables activity which will fulfill the Applicant's ultimate goal of creating additional industrial land.

Response provided by Harry B. Heller

Commission Question:

Please describe how “blasting” and “rock crushing” and “rock shot” is deemed either as an “Incidental” use or a “Principal” use, in terms of this application.

GFI Response:

The uses described in this question are integral components of the "Excavation Major" activity permitted by special permit in the Zoning Regulations. Section 8.16(I) of the Zoning Regulations provides: "The use of explosive devices and rock crushing equipment may be limited as a condition of the permit." Thus, the regulation itself contemplates that both blasting and aggregate processing are permitted components of the Excavation Major special permit use classification. It is therefore the Applicant's position that the activities described in the question posed are integral components of the permitted use. Under general principles of Connecticut law, when a zoning commission is exercising permitting authority in evaluating a special use permit, the zoning authority has discretion, in appropriate circumstances, to impose conditions on the use in order to satisfy the permitting criteria contained in the special permit general evaluation criteria (in Ledyard, Section 11.3.4 of the Zoning Regulations).

GFI Response:

We also note that Section 7.10.1 of the Zoning Regulations provides as follows: “To facilitate the clearing of land on parcels that are actively being developed, temporary sawmills and stone crushing equipment may be utilized under the following conditions: …” Therefore, on a temporary basis, stone crushing may also be permitted in conjunction with this application under that regulation.

The Applicant notes that, while the activity for which a permit is sought is Excavation Major, the purpose of this excavation is to create 26 acres of uniquely developable industrial land with access to a deep water port, rail service, state highway infrastructure and a 115KV transmission line and immediately adjacent substation to support a variety of different types of potential energy related uses to be developed on the property subsequent to the completion of the industrial regarding.

Response provided by Harry B. Heller

Commission Question:

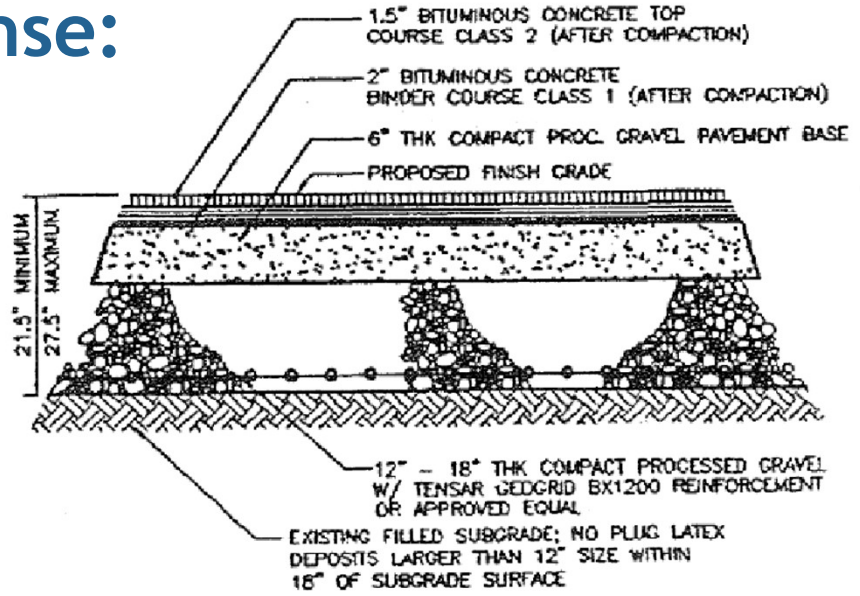
Please describe the contents/ characteristics of the capped area of the site as identified in the application as a remnant from the Dow era of use.

GFI Response:

The “engineered control” (cap) covers latex waste that was deposited within the subject area during the active operation of the facility.

The asphalt cap design and specifications includes a combined thickness of asphalt (1.5 inches bituminous concrete top course and 2-inch bituminous concrete binder course) and other components of the constructed cap (compact process gravel, geogrid, etc.) varies between 21.5 and 27.5 inches across the 5.2 acre cap. It provides a robust barrier between potential receptors at the ground surface and impacted subgrade fill soils. The geogrid (Tensar® Geogrid BX 1200), provides geotechnical stability for the cover system, limiting differential settlement. A detail of the cap section is included below (extracted from the plan for the cap submitted to DEEP and approved).

GFI Response:



As noted above, the existing cap was designed specifically to mitigate deformation of the underlying soils, specifically with the Tensar Geogrid and the substantial 12” to 18” compacted processed aggregate installed below the 6” pavement base and the asphalt surface. The design facilitated the continued use of the area by heavy industrial equipment. The construction of the additional “interim cap” constructed on the surface of the existing cap was specifically designed to provide protection to the underlying asphalt surface.

GFI Response:

The interim cap was specifically designed with a minimum 6” base consisting of asphalt millings or processed aggregate, depending on the location which will distribute surface loading over a much larger area onto the existing asphalt surface, thereby providing significant protection of the underlying asphalt surface. Collectively, the interim cap upon the existing cap provides over 29” of gravel base and asphalt upon a geogrid, which far exceeds the requirements for any roadway constructed in the Town of Ledyard (Local Street – requires an 8” gravel subbase, 4” Processed aggregate base with 2” binder and 1 ½” Surface course). Providing such a form and stiff base is the key to mitigating deformation and potential cracking of the underlying asphalt. As such, the interim protective cap needs to be looked at as a system along with the existing cap to ensure adequate protection, which is the basis for the design provided.

Response provided by Loureiro Engineering Associates, Inc.

Commission Question:

Please describe any all progress made on the new mitigated wetlands as previously approved by the IWWC in 2023.

GFI Response:

The permit issued by the Ledyard IWWC required the Applicant to create compensatory wetlands (“mitigation”) at the approximate rate of 3 square feet of created wetland for each square foot of wetland potentially disturbed. The express terms of the permit issued by the Ledyard Inland Wetlands and Watercourses Commission requires wetland mitigation to be completed prior to the completion of Phase I of the Excavation Major. As of this date, the Town of Ledyard Planning and Zoning Commission has not issued any approval which authorizes construction activity on the property; either in conjunction with the proposed Excavation Major or the related wetland mitigation which is occurring in a different area of the property.

GFI Response:

Wetland mitigation has not commenced to date, and will not be commenced, until such time as the Excavation Major project commences. At such time as construction activities commence on the property, the creation of the mitigation wetlands will likewise commence in order to ensure that mitigation is fully completed prior to the completion of Phase I of the proposed excavation. Bonding will be provided in order to ensure that the wetland mitigation is completed in accordance with the wetland mitigation protocol depicted on Sheet C-7A and C-7B of the site development plan.

Response provided by Harry B. Heller

Commission Question:

Please describe/characterize/define the "conditions precedent hereinafter contained" in the agreement between the Historic Preservation. If the permanent perseveration enacted until "the event that the Owner obtains final, unappealable, approval from all applicable regulatory boards, commissions and agencies of the Town of Ledyard"..... Is there really an agreement between Owner and SHPO? What purpose does this document serve?

GFI Response:

The agreements reached by the Applicant with The Archaeological Conservancy (perpetual custodian and owner) and the State Historic Preservation Office (regulatory authority) contains two components. The first component requires the Applicant to deed 3.44 acres of land to The Archaeological Conservancy pursuant to the terms and provisions of the Donation Agreement (referenced in Exhibit 95-2), Gales Ferry Intermodal, LLC has contractually agreed to immediately donate the 3.44 acre site located north of the Eversource transmission line easement to The Archaeological Conservancy in fee simple. This 3.44 acre parcel accommodates the former location of Fort Decatur, the sentry outpost and the related areas located north of the Eversource transmission line easement deemed historically significant by Heritage Consultants. This dedication is a non-contingent contractual obligation of Gales Ferry Intermodal, LLC. The "conditions precedent hereinafter contained" referenced in the question applies to additional obligations of Gales Ferry Intermodal, LLC which will only arise in the event that the Excavation Major special use permit is approved by the Ledyard Planning and Zoning Commission.

GFI Response:

In the event that the Excavation Major permit is approved, the condition precedent will be satisfied and Gales Ferry Intermodal, LLC will thereafter be further obligated to convey to The Archaeological Conservancy a 5.87 acre parcel of land located on the southerly side of the Eversource transmission line easement, fund the preparation of a treatise on Commadore Decatur, fund the nomination cost for the nomination of the Fort Decatur site to the National Register of Historic Places and donate an additional Ten Thousand and 00/100 ($10,000.00) Dollars to The Archaeological Conservancy. The Historic Preservation Agreement therefore defines both what Gales Ferry Intermodal, LLC is contractually and regulatorily required to do under all circumstances as well as identify those additional obligations of Gales Ferry Intermodal, LLC which arise only in the event that the Excavation Major special use permit is approved. It should further be noted that the 5.87 acre parcel referenced above is located southerly of the Eversource transmission line easement, and is not the subject of any permitting proceeding currently pending or contemplated on the Applicant's property.

Response provided by Harry B. Heller

Commission Question:

What is the particulate matter generated per year - across the site across various activities - expected to be based on the current application?

GFI Response:

The facility is proposing to process 750,000 tons of material annually, which would result in 5.35 tons per year (TPY) of PM10 and 0.72 TPY of PM2.5 at the point of generation at the site, which is well below the state air emissions particulate permit threshold of 15 TPY. The emissions at the source are then dispersed into the air and, based upon USEPA air emissions modeling, would result in a 24-hour (worst case, Scenario 2) maximum property boundary concentration of PM10 of 102 micrograms per cubic meter (ug/m3), which includes a background particulate concentration of 30 ug/m3 plus the modeled process emissions concentration of 72 ug/m3. This 24-hour maximum boundary concentration of 102 ug/m3 is below the 24-hour national ambient air quality standard (NAAQS) for PM10, which is 150 ug/m3.

GFI Response:

The 24-hour (worst case, scenario 3) maximum boundary concentration for PM2.5 is 22.5 ug/m3, which includes a background particulate concentration of 15 ug/m3 plus the modeled process emissions concentration of 7.5 ug/m3. This 24-hour maximum boundary concentration of 22.5 ug/m3 is below the 24-hour NAAQS for PM2.5 of 35 ug/m3.

Similarly, the maximum annual daily average boundary concentration for PM 2.5, which would be from scenario 3, would be 7.7 ug/m3, which includes a background particulate average daily concentration of 5.4 ug/m3 plus the modeled process emissions of 2.3 ug/m3. This annual daily average PM 2.5 value of 7.7 ug/m3 calculated over a one-year period is below the NAAQS of 9 ug/m3.

GFI Response:

Therefore, the hourly and annual particulate emissions along the property boundary, assuming the worst-case scenarios, are protective of human health and the environment. Existing AMSTY structures/buildings/etc. were included as potential impacts on the air modelling output due to their size (i.e., potential objects causing downwash). However, emissions generated from AMSTY operations were not included in our assessment, as they are not under the operational control of Cashman.

Response provided by Suzanne Pisano of Verdantas

Commission Question:

Has the applicant addressed conditions and plans pertaining to existing AMSTY structures - buildings, tanks and utilities etc - in detail as it pertains to current application, uses and activity proposed in the application?

GFI Response:

YOUR TRUSTED BREED
making it happen

MAINE DRILLING & BLASTING, INC. – RESPONSE LETTER

December 16, 2024

To Whom it May Concern,

This letter is in response to the Planning and Zoning Public Hearing-Special Meeting notes dated December 12, 2024. Maine Drilling & Blasting, Inc. (MDB) is responding to questions submitted by 24-8SUP24-9CAM Commissioner Ribe PZC GFI Questions 12-16-24.

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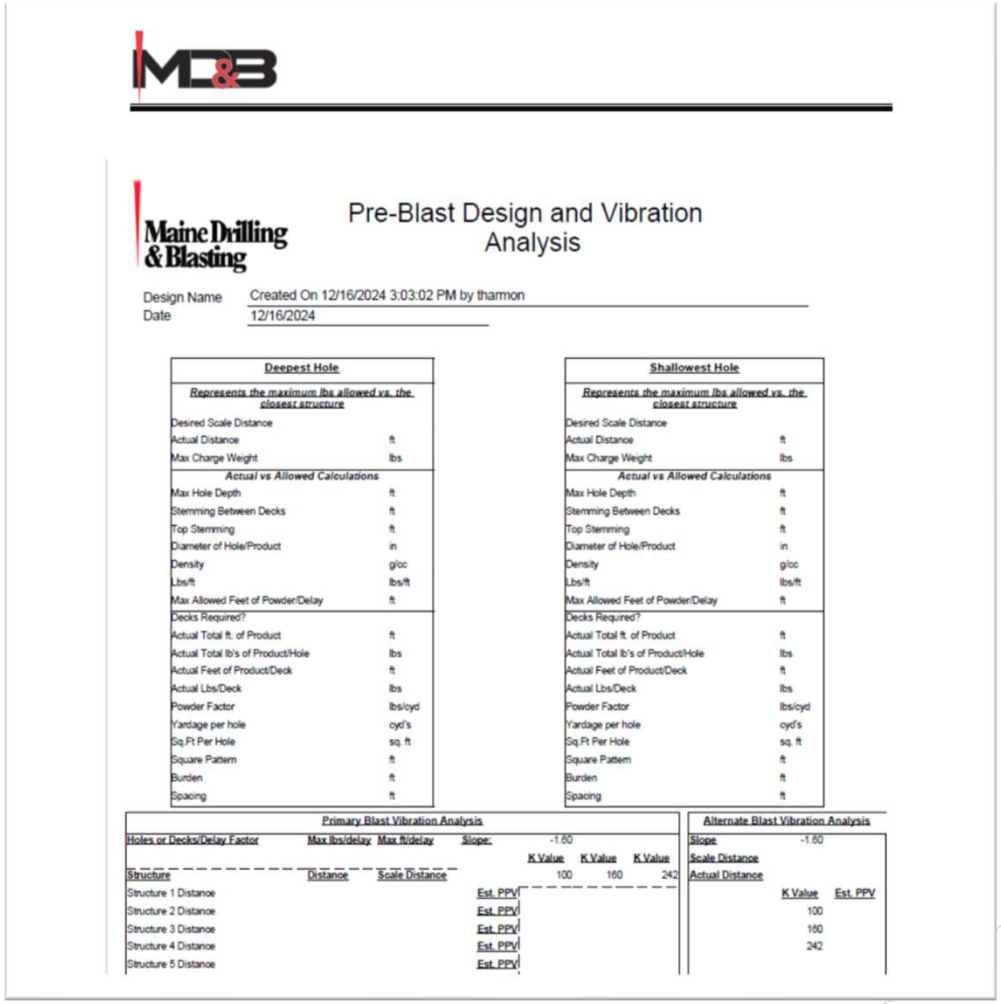
"Has the applicant addressed conditions and plans pertaining to existing AMSTY structures - buildings, tanks and utilities etc - in detail as it pertains to current application, uses and activity proposed in the application?"

- All blasts on this project will be scaled to the closest uncontrolled structure. The formula $(Distance/24(Scaled\ Distance))^2$ will be used to calculate the appropriate charge. Using this desired "scaled distance" all blasts will be designed to stay below 1.00in/sec peak particle velocity. This will vary greatly throughout the project as distances change.
- In addition, blasts in the initial phase (closest to Amsty or utilities) will be matted until the site has developed to a safe distance.
- Below is an example of our Blast Design Calculator used to predict vibration:

GFI Response:



MD&B

Maine Drilling & Blasting

Pre-Blast Design and Vibration Analysis

Design Name: Created On 12/16/2024 3:03:02 PM by tharmon
Date: 12/16/2024

Deepest Hole	
Represents the maximum lbs allowed vs. the closest structure	
Desired Scale Distance	
Actual Distance	ft
Max Charge Weight	lbs
Actual vs Allowed Calculations	
Max Hole Depth	ft
Stemming Between Decks	ft
Top Stemming	ft
Diameter of Hole/Product	in
Density	g/cc
Lbs/ft	lbs/ft
Max Allowed Feet of Powder/Delay	ft
Decks Required?	
Actual Total ft. of Product	ft
Actual Total lb's of Product/Hole	lbs
Actual Feet of Product/Deck	ft
Actual Lbs/Deck	lbs
Powder Factor	lbs/cyd
Yardage per hole	cyd's
Sq.Ft Per Hole	sq. ft
Square Pattern	ft
Burden	ft
Spacing	ft

Shallowest Hole	
Represents the maximum lbs allowed vs. the closest structure	
Desired Scale Distance	
Actual Distance	ft
Max Charge Weight	lbs
Actual vs Allowed Calculations	
Max Hole Depth	ft
Stemming Between Decks	ft
Top Stemming	ft
Diameter of Hole/Product	in
Density	g/cc
Lbs/ft	lbs/ft
Max Allowed Feet of Powder/Delay	ft
Decks Required?	
Actual Total ft. of Product	ft
Actual Total lb's of Product/Hole	lbs
Actual Feet of Product/Deck	ft
Actual Lbs/Deck	lbs
Powder Factor	lbs/cyd
Yardage per hole	cyd's
Sq.Ft Per Hole	sq. ft
Square Pattern	ft
Burden	ft
Spacing	ft

Primary Blast Vibration Analysis

Holes or Decks/Delay Factor | Max lbs/delay | Max ft/delay | Slope: -1.60

Structure	Distance	Scale Distance	Est. PPV	K Value 100	K Value 160	K Value 242
Structure 1 Distance			Est. PPV			
Structure 2 Distance			Est. PPV			
Structure 3 Distance			Est. PPV			
Structure 4 Distance			Est. PPV			
Structure 5 Distance			Est. PPV			

Alternate Blast Vibration Analysis

Slope -1.60
Scale Distance
Actual Distance

K Value	Est. PPV
100	
160	
242	

Commission Question:

Was a traffic study ever done to determine the impact to traffic on Rt 117 of southbound Rt 12 traffic traveling east on Rt 214 and then south on Rt 117 to avoid traffic conges on Rt 12 past the excavation/quarrying area?

GFI Response:

The traffic impact study that was conducted reviewed operations on Route 12 between Route 214 and Hurlbutt Road. No analysis was completed for Routes 214 and 117, except for the intersection of Route 214 with Route 12.

A review of Google Maps indicates that travel times along Routes 12, 2A, 2 and I-95 are similar to those along Route 214, 117 and other local roadways, for traffic destined to Towns other than Ledyard, Preston, North Stonington or parts of Groton north of I-95 and East of Route 12.

Routes 2 and 12 provide 36 -40 feet of pavement with wide shoulders and sweeping curves. The roadway is posted at speeds between 35 and 50 miles per hour. Routes 214 and 117 are much narrower, providing 24 to 26 feet of pavement, with narrow shoulders and posted speeds of 30 miles per hour. The roadways follow a much more winding and curving alignment.

GFI Response:

Since the travel times are similar, and Route 12 is much more conducive to truck travel, it is unlikely, in my opinion, that trucks would utilize Routes 214 and 117 for deliveries outside of Ledyard, Preston and North Stonington.

With a peak hour generation of 51 trips, including 13 peak hour truck trips, there will be, in my opinion, no significant impact from a capacity standpoint on local roadways. One must also consider, that if there is a delivery required within Ledyard and North Stonington south of Route 2, trucks will need to use the same local roadways to access those sites, as they would from the proposed site.

For these reasons, our analysis was limited to Route 12 in the vicinity of the site.

Response provided by F.A. Hesketh & Associates, Inc.

Commission Question:

What are the peak times of day for truck traffic entering and leaving the site and how does this timing relate to school bus traffic and commuting traffic?

GFI Response:

In accordance with the special use permit application and Zoning Compliance Manual for the proposed Excavation Major, operations on the site cannot commence prior to 7:30 a.m. and may continue to 5:30 p.m., excluding Sundays. As stated on numerous occasions in the public hearing process before the Ledyard Planning and Zoning Commission, only substratum (not marketable material and not material to be utilized in conjunction with the reclamation of the property) will be exported from the project by truck. Based upon the volume of storage area depicted on the site development plan, the Applicant possesses the flexibility to monitor and stage when trucks will be entering and leaving the site during each workday. The permit application limits truck traffic to 50 round trips per day which is a de minimis amount of additional site generated traffic considering the carrying capacity of Connecticut Route 12.

GFI Response:

The Applicant can work with the Town of Ledyard, as a condition of special use permit approval, to avoid any significant amounts of truck traffic on the highway during school bus hours. While the traffic study performed by F.A. Hesketh & Associates utilized 13 truck trips in the peak hour to determine whether or not adverse impacts would occur, with proper coordination with the Department of Education, truck trip generation and routing can be modified to alleviate any perceived adverse effects.

Response provided by Harry B. Heller and F.A. Hesketh & Associates, Inc.

Commission Question:

What are the realistic potentials for closure of Rt 12 during blasting events and what effects will this have on Fire Department availability for town emergencies, school bus traffic, and commuting traffic? What will be the dura on of potential Rt 12 closures during blasting events?

GFI Response:

After consultation with Maine Drilling and Blasting, as well as Jeff Slade, Senior Geologist with Continental Placer/Adirondack Consulting Services, it has been determined that the only time that a temporary closure MAY be required on Route 12 is in conjunction with blasting activities in Phase 3.2 of the project. As depicted on Sheet C-3 of the site development plan, Phase 3.2 is a small 3 acre phase in closest proximity to Connecticut Route 12. In the event that closures are required in Phase 3.2, Maine Drilling and Blasting has indicated that the duration of the closure will not exceed five minutes for each blast event. For purposes of clarity, no closures will be required in any other phase of the proposed excavation.

GFI Response:

The project protocol limits blasting between the hours of 11:00 a.m. and 4:00 p.m., Monday through Friday. Since only 1 – 2 blasts will occur in any given week, blasting within this time window can be scheduled to avoid any time when trucks are travelling on Route 12 for Phase 3.2 purposes and commuting peak hours. If a Phase 3.2 closure is deemed necessary by the blaster, we do not anticipate that a 5 minute closure will have any adverse impact on the fire department to provide services to address town emergencies.

Response provided by Harry B. Heller

Commission Question:

The modeling for noise, vibration, and dust all show levels below the State and Federal limits. However, modeling was conducted at ground level, but the initial phases of blasting will be 150 feet higher at the top of the hill. What is the confidence that modeling at five feet (bottom of the hill) will adequately reflect air emissions, noise, and vibration from blasting at 150 feet (top of the hill)?

GFI Response:

For purposes of clarity, initial blasting events will be at the bottom of the hill, not the top of the hill. Notwithstanding that clarification, it is undisputed that blasting will occur at higher elevations. As Gales Ferry Intermodal, LLC has engaged the services of three (3) separate consultants to evaluate noise, vibration and dust impacts, it is providing responses from each consultant with respect to such consultant's individual discipline (see attached).

GFI Response:

VIBRATION

Modeling of blasting vibrations and air over-pressures are not significantly affected by elevation differences between the source and receivers. Blasting higher in elevation than receivers increase the travel distance for ground vibrations, thereby reducing the predicted amplitudes of ground velocities. The science of air over-pressure from blasting is well understood and documented. Air pressures from a blast rise upward in the air and never travel downward. This is because air pressure waves travel in the direction of colder air according to the laws governing thermoclines. We blast late in the morning to ensure temperature inversion does not exist (elevated warm air over cold air near ground level) where noise can reflect downward. As such, noise from blasting cannot possibly increase below the elevation of blasting. This is a well-established fact based on science.

GFI Response:

Test blasting planned for the site will establish a site attenuation model that will reflect safe and prudent blasting practice. The attenuation modeling will serve as a guide to blast design and the model will not change over the life of the project. No off-site impacts of blasting will exceed those predicted by the on-going modeling to ensure compliance with safe ground vibrations and air overpressures.

Response provided by Dr. Cathy Aimone-Martin

GFI Response:

NOISE

With respect to the question on sound modeling and terrain, the noise study models all sources at their anticipated heights above ground and at their anticipated elevations above sea level. It also includes the propagation effects of terrain.

Response provided by Ken Kaliski of RSG, Inc.

GFI Response:

DUST

Dust is modeled at the elevation where the activities occur and incorporate topography of the site (including as it changes with each phase), but also of the surrounding neighborhoods. So, modeling included the exact location (point) and elevation of where the blasting occurs, not just at the ground level. The dispersion model looks both vertically and horizontally from the point of the emission.

Response provided by Suzanne Pisano of Verdantas

Commission Question:

In the event that the modeling grossly underestimates actual air emissions, noise, and vibration at different phases of the excavation/quarrying efforts such that operations are required to cease permanently, is there a contingency plan for reintroducing overburden and topsoil to the remaining, partially excavated and quarried hill, and is there a bond/escrow account specifically identified as for use for this purpose in the event that the proposed plans can not be completed for these reasons?

GFI Response:

A bond has been proposed in conjunction with the application. See Section II, Item 3 of the Zoning Compliance Manual, Exhibit 2 in the record. The Bond Estimate exceeds $3,000,000.00 for soil and erosion control. While the Bond Estimate does not specifically contemplate the question posed, items such as complete landscaping of benches would not be required in the event that the Excavation Major operation ceased permanently prior to completion. All subsoil and topsoil excavated on the property must be retained on the property for future stabilization; therefore, the bond amount proposed by the Applicant is more than sufficient to accommodate this eventuality.

Response provided by Harry B. Heller and
George Andrews of Loureiro Engineering Associates, Inc.

GFI Response:

For purposes of context, see response of Jeff Slade, Senior Geologist for Continental Placer/Adirondack Geologic Services below:

I took a look at the seeding/grading restoration Bonding estimate that George put together for the GFI project which is approximately 3.15 million dollars for a 45 acre development site ($70,000 per acre). QUARRY and mining operations are typically required to have a reclamation/restoration bond for the life of the operation. In New York the mined land reclamation law is regulated at the state level and all mines/quarries are required (by law) as part of the mine permit condition to have bonding. The typical per acre reclamation bonding amount for quarries (50-80 acre size) in New York average $10,500 to $12,000 per acre. Looking at some of our large national clients, where we are asked to review regulatory reclamation bonding, bonding for quarry operations averages $9,000 to $12,000 per acre.

GFI Response:

The other key item here is that the bonding is typically only required for acreage that is disturbed/impacted by the currently permitted phases. The 70K bonding versus 10-12K, is another clear fact, that the GFI project is a land development project, as no mining company is going to put up millions of dollars $(3.2 million) of financial surety over the life of a 45 acre quarry operation, while only mining 10 acre phases.

Response provided by Jeff Slade, Senior Geologist, PG, Continental Placer, Adirondack Geologic Services

Commission Question:

How much slag will there be in the water runoff that enters the Thames River on a daily basis and what is the sum total of slag that will enter the Thames River during the entire 10-year project? What impact will this slag burden have on the shipping channel at the proposed excavation site and down river?

GFI Response:

It should be noted that slag is not the correct terminology. "Slag" is a waste product created when smelting ores and recycled metals, or during other metallurgical and combustion processes. In responding to the question, we have assumed that the concern is with sediment that may enter the Thames River. With respect to sediment control, please see the following response of Loureiro Engineering Associates, Inc.:

Assuming the reference to slag is related to suspended solids contained within the water runoff, we have designed the site to meet the 2023 Stormwater Quality Manual post-construction pollutant reduction of 90% reduction in suspended solids by the active retention of the water quality volume on site. In addition to meeting this standard, we have proposed a Hydrodynamic separator to further polish the stormwater discharge prior to introduction into the receiving wetland.

GFI Response:

Due to the dynamics of active construction, we are not able to compute the actual value of suspended solids that will migrate from the site, when construction is actively underway. We have adopted best management practices for the construction activities and will be providing monitoring, maintenance and inspections in accordance with the Connecticut Department of Energy and Environmental Protection's General Permit for the Discharge of Stormwater and Dewatering Wastewaters During Construction (Stormwater GP), which is highly protective.

Our primary concern with sediment erosion is during the excavation of the overburden soils. We have adopted a conservative process including the use of EarthGuard® Erosion Control product for surficial stabilization. Earthguard® is the highest rated erosion control performance ever tested (per AASHTO/NTPEP Testing). It bonds molecularly with the soil and prevents stormwater from carrying sediment downstream, while maintaining pore space to encourage water infiltration. The erosion protection measures proposed for this project are detailed on sheet 2, C-1 of our drawing plan set. Further details are provided in our Stormwater Pollution Control Plan submitted to the town.

GFI Response:

Based upon the location of the discharge from the proposed excavation area and the processing area, and the characteristics primarily related to the favorable infiltration rate, of the receiving wetlands, we expect a minimal discharge of sediment to the receiving areas. The excavation area has a robust sediment catchment system proposed throughout the construction period along with a herringbone network of water bars designed to direct stormwater flows to these sediment basins. The processing area is equipped with a crushed stone surface finish and has a double row of 18” mulch sock, which is a substantial means of sediment separation, with established forebay retention areas at the low points. The crushed stone surface treatment is rated at a 95% reduction in erosion based upon the soil erodibility factor in the Universal Soil Loss Equation.

Based upon the best management practices proposed and the inspection and monitoring requirements of the Stormwater GP, we expect little to no impacts to the Thames River.

Response provided by George Andrews of Loureiro Engineering Associates, Inc. with editorial comment in first paragraph by Harry B. Heller

Commission Question:

If the noise decibel limit is 61 dB, how can the blasting threshold limit be 130 dB? Why the exemption for blasting? Granted it is an impulse noise, but it still exceeds the 61 dB limit, does it not?

GFI Response:

The 61 dB is properly designated as 61 dbA (A-weighted decibel). This limit is applied only to continuous noise sources such as construction machinery (dozers, impactors, vibratory rollers, trucks and so forth). A-weighting takes into consideration very high frequency noise sources well above 10,000 Hz. Impulsive blasting air pressures, measured with pressure sensors, are converted to decibels using a linear (L) weighting scale. Thus the 130 should be properly noted as 130 dBL. Electronic filtering systems used with blasting-type seismographs filter out all frequencies except those from 2 to 250 Hz where milli-second (transient) blasting pressures reside. The systems are unrelated and cannot be compared.

Response provided by Dr. Cathy Aimone-Martin

Commission Question:

Was a study ever done to model the impact of using public water from the aquifer for road, blast site, and equipment spraying to minimize dust production under typical conditions versus under drought conditions? Was there any consideration made to using water from the Thames River for spraying efforts rather than from the aquifer?

GFI Response:

First, the volumes of water required for site dust control (including wetting of blasts, mist application to travel ways and mist application on all earth product processing and conveying equipment has been misrepresented by the opposition in the public hearing process. The record evidences the fact that a maximum of 23,000 gallons per day will be required for all dust control applications during drought conditions. 23,000 gallons per day is a de minimis amount of water within the context of Groton Utilities' water supply system. In the public hearing process, with respect to this application former Chairman Capon indicated on the record that "There have not been any water restrictions imposed by Groton Utilities during his time on the Ledyard Water Pollution Control Authority."

Notwithstanding this fact, the Applicant understands that, during drought conditions, water restrictions may be imposed by Groton Utilities. In such an eventuality, temporary water withdrawal from the Thames River and/or from an on-site bedrock water source are viable options for providing water necessary to effectively accomplish dust suppression.

GFI Response:

Thames River – water from the Thames River can be used for dust control, based upon telephone conversations and e-mail exchanges with representatives from the Connecticut Department of Energy and Environmental Protection (see attached). We will need to keep the usage below 50,000 gallons per day, which is well below our projection of 23,000 gallons per day to avert the need for a Diversion Permit.

Existing Dry Hydrants – water is available on site from an existing dry hydrant sourced by an on-site water source for dust control. This infrastructure is in place and ready for use.

In summary, three separate sources of water are available for dust control on the site and with the capacity of the Thames River available during drought conditions, no adverse impacts to the public water supply are expected.

Response provided by Harry B. Heller and George Andrews of Loureiro Engineering Associates, Inc.

GFI Response:

George F. Andrews

From: DEEP WaterDiversion <DEEP.WaterDiversion@ct.gov>
Sent: Monday, September 30, 2024 9:31 AM
To: George F. Andrews
Subject: RE: Construction Water Source

Hello George,

Thank you for reaching out. You are correct – the contractor may withdraw the 25,000 GPD from the Thames River without needing a permit from DEEP. DEEP regulates water withdrawals from surface and/or groundwater that exceed 50,000 GPD.

There may be local authorizations from the municipality, but the project as your described would not need an authorization from DEEP.

Take care, and feel free to reach out again if any other questions come up.

Alexandria (Ali) Hibbard she/her
Environmental Analyst
Water Planning and Management Division
Connecticut Department of Energy & Environmental Protection
79 Elm Street, Hartford, CT 06106-5127
p: 860.424.3348 | Alexandria.Hibbard@ct.gov

Connecticut
Department of Energy &
Environmental Protection

Conserving, improving, and protecting our natural resources and environment;
Ensuring a clean, affordable, reliable, and sustainable energy supply.

GFI Response:

From: George F. Andrews <gfandrews@loureiro.com>
Sent: Friday, September 27, 2024 3:56 PM
To: DEEP WaterDiversion <DEEP.WaterDiversion@ct.gov>
Subject: Construction Water Source

1

I'm involved in a project located along the Thames River that will require up to 25,000 gallons of water per day for site dust control including misting operations at select material processing (crushing) operations and general site dust control. I have reviewed the diversion program and want to verify that the Contractor for this site may withdraw up to 25,000 GPD for dust control water suppression from the Thames River for use in this construction process. The site is equipped with a pier, where the suction hose would be mounted.

Please advise if you need any additional information.

George Andrews Jr., PE, LEP
Principal Engineer, Civil Engineering

Loureiro Engineering Associates, Inc. | An Employee Owned Company
100 Northwest Drive, Plainville, CT 06062 | **D:** 860.410.2906 | **C:** 860.729.6460

Our job each day is to understand our clients' needs and ensure that they experience a level of service that exceeds their expectations. Please provide us with feedback on how we are doing by clicking here

Commission Question:

The amount of acreage donated to the Historical Preservation Society for preservation of the site of Fort Decatur (~ 3.5 acres) seems quite low relative to the amount of acreage dedicated to the preservation of other sites of similar historical importance, Fort Griswold for example. Is there a possibility of increasing the donated acreage without adversely the excavation/quarrying operations.

GFI Response:

The area for donation around Fort Decatur was selected based on the distribution of archaeological deposits associated with its occupation by Stephen Decatur and his men During the War of 1812 as determined by multiple investigations undertaken by Heritage Consultants, LLC. Archaeological examination of Mount Decatur through the use of pedestrian survey, metal detection, ground penetrating radar investigation, magnetometer survey, and unit excavations revealed that the cultural deposits associated with the occupation of the fort on northern side of the existing Eversource Energy powerline corridor were relatively tightly clustered around the earthworks (e.g., fort and north sentry post) and were lacking in other areas of Mount Decatur on the north side of the powerline easement. This distribution of archaeological materials and associated historical activity areas is consistent with the type of occupation Fort Decatur represents, which was short term in comparison to other fortifications such as Fort Griswold and Fort Trumbull, where occupations extended for decades and through multiple wars.

GFI Response:

Fort Decatur was a defensive position that was built as an emergency earthworks and was used for that purpose for no more than a year or so. It was abandoned after the conclusion of the War of 1812 and reclaimed by the forest that has been allowed to grow on Mount Decatur over the last century or so. The area of donation for the portion of the Fort Decatur Site on the north side of the Eversource Energy has been agreed to by The Archaeology Conservancy, the Connecticut State Historical Preservation Office, and the Applicant. It represents as a reasonable accommodation between historic preservation and Project activities.

GFI Response:

Unlike other historical fortifications along Connecticut's coastline, including Fort Trumbull, For Griswold, Fort Nathan Hale, and the Black Rock Fort, the area containing Fort Decatur will be left in its current state. It will transferred to and remain under the ownership and control of The Archaeological Conservancy, who will provide limited and controlled public access to prevent damage and long term degradation of the area. Unlike other publicly accessible fortifications in Connecticut, the Fort Decatur Site will be maintained in its historic context and setting, and it will be set aside for investigation by future historians and archaeologists. As such, it will remain an unaltered symbol of and a significant place for the remembrance of the War of 1812, Stephen Decatur, and the activities that occurred in the Gales Ferry area over 200 years ago.

Response provided by David George of Heritage Consultants

Commission Question:

I wish to know the L10 and L50 levels for the sound surveys taken. The L90 has been provided, commonly referred to as ‘background noise’. I am requesting the L10 and L50 values.

GFI Response:

The L10 and L50 for the background sound monitoring are provided in Table 4 of the September RSG report for the first four sites and Table 1 of my December 10 response to HMMH memo.

TABLE 4: SUMMARY OF BACKGROUND SOUND LEVELS BY MONITOR

Monitor	Sound Level (dBA)											
	Overall				Day				Night			
	L_{eq}	L_{90}	L_{50}	L_{10}	L_{eq}	L_{90}	L_{50}	L_{10}	L_{eq}	L_{90}	L_{50}	L_{10}
Entrance	64	49	58	68	65	52	62	68	61	48	51	65
House	56	40	53	59	57	47	55	60	52	37	44	56
River	43	36	40	44	44	38	41	45	41	36	38	43
Woods	47	44	46	48	47	44	46	49	45	43	45	46
Average	52	42	49	55	53	45	51	55	50	41	44	53

GFI Response:

TABLE 1: OVERALL SOUND MONITORING RESULTS FOR THE 'ROUTE 12 HOMES' SOUND MONITOR

Monitor	Sound Pressure Level (dBA)											
	Overall				Day				Night			
	L_{eq}	L_{90}	L_{50}	L_{10}	L_{eq}	L_{90}	L_{50}	L_{10}	L_{eq}	L_{90}	L_{50}	L_{10}
Rt 12 Homes (new)	60	48	56	64	62	52	60	65	57	47	52	62

Response provided by Ken Kaliski of RSG, Inc.